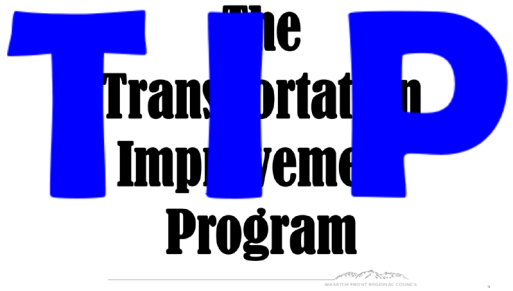
The Transportation Improvement Program



Transportation Improvement Program - Today . . .

4a. Report on Approved Board Modification

- Regional Council – May 25, 2023

4b. Approve New Board Modification

- To the 2023-2028 TIP

4c. Release the Draft 2024-2029 Transportation Improvement Program (TIP) and Air Quality Conformity Analysis for Public Review and Comment

Transportation Improvement Program is . . .

1. Six Year Program of Highway, Transit, and Active Transportation Projects
    - Four Years Funded - Two Years Concept Development
2. In the Urban Areas
    - Salt Lake/ West Valley - Ogden/ Layton
3. Funded by
    - Federal, State, & Local Programs
4. For All Cities, Counties, UDOT & UTA

Transportation Improvement Program will . . .

1. Implement the Long Range Plans
    - Highway/ Transit and Active Transportation Projects for the Region
2. Help Meet the Short Range Needs
    - Of the Wasatch Front Area
3. Provide for the Maintenance
    - Of the Existing Transportation System

Transportation Improvement Program Contains . . . .

- Lists of Projects
- Including;
  - New Construction
  - Rehab & Maintenance
  - Safety/ ITS
  - Transit, O & M
  - Pedestrian & Bike

Projects in the TIP:

- Represent $ Millions
- Thousands of Jobs
- Economic Growth & Development
- Mobility/ Access
- Preservation of Life
- And Promote the Quality Of Life

The Transportation Improvement Program

Federal Law Requires:

- Financially Constrained
- Conform To Air Quality
- Reviewed By the Public
- Approved by Regional Council

4a - 2023-2028 TIP Board Modification #8

Wasatch Front Regional Council

May 25, 2023

Ben Wuthrich

Wasatch Front Regional Council

WASATCH FRONT REGIONAL COUNCIL

2023-2028 Transportation Improvement Program (TIP) (Amendment Eight)

Board Modification

Additional Funding

Ogden/ Layton Urban Area

County	Sponsor	Facility	PIN	Project Location	Concept/ Type of Improvement	Funding Source	Project Estimated Cost	Currently Funded Amount	Action	Funding Amount	Year
Weber	UDOT	I-15	20008	I-15; MP 340 to MP 341 (Approx 4100 So to 4500 So) (Riverdale Area)	Replace Barrier & Crash Cushions on I-15	NHPP_BR (National Highway Performance Program - Bridge On)	$2,160,000	$150,000	*New Funding*		2023-2024
						NHPP_IM (National Highway Performance Program - Interstate Maintenance)		$1,200,000			
						STP_FLX_ST (Surface Transportation Program - Flexible (Any Area) Statewide)		$100,000			
						R!_TSP (Region One Transportation Solutions Program)		$110,000		**$600,000**	

The Department recently advertised the Replace Barrier & Crash Cushions on I-15 project. The Department received 4 bids, with the low bidder coming in at 140% of the engineer's estimate. The project team has reviewed the bids and determined it is unlikely readvertising would result in lower bids. Region One is recommending adding funds to the project in order to award the project to the apparent low bidder.

Funding Addition/ Scope Change

Ogden/ Layton Urban Area

County	Sponsor	Facility	PIN	Project Location	Concept/ Type of Improvement	Funding Source	Project Estimated Cost	Currently Funded Amount	Action	Funding Amount	Year
Davis	UDOT	West Davis Hwy (SR-177)	11268	West Davis Hwy (SR-177); I-15 & SR-67 to SR-193	Extend West Davis Highway from SR-193 to 1800 North as cleared in the West Davis EIS	L_BETTERMENT (Local Government Betterment CO-OP)	$900,193,663	$3,548,663	*Additional Funding*		2023
						ST_CONST (State Construction)		$40,000,000			
						ST_TIF (StateTransportation Investment Funds)		$737,470,000		**$119,000,000**	

The additional scope of the West Davis Corridor from SR-193 to 1800 North was studied and cleared as part of the West Davis Environmental Impact Statement (EIS) in 2017. Due to lack of available program funding in the 2018 Commission workshop, this scope was not included in the current Design Build project. The additional funding would complete the work cleared in the 2017 EIS. This section of the West Davis Highway is approximately 2.5 miles in length and would include a single lane in each direction.

New Programs and Program Reset

Statewide Programs

County	Sponsor	Facility	PIN	Project Location	Concept/ Type of Improvement	Funding Source	Project Estimated Cost	Currently Funded Amount	Action	Funding Amount	Year
Various	UDOT	Various	New	Various Statewide Programs	State Funded Programs	ST_GF (State General Fund)	$587,600,000	$0	*2024 Program*	**$587,600,000**	2024

The funding levels for the State Funded Programs are amended into the existing TIP each year in May prior to the new State Fiscal Year which begins July 1. These programs include funding levels for Operations & Safety Programs, System Preservation Programs, Region Contingency Funds, other programs, and Region Concept Development. (Please reference the attached table "State Programs funded with State and Federal Funds", for funding assignment and distribution.)

4b - 2023-2028 TIP Board Modification #9

Trans Com
June 15, 2023

Ben Wuthrich
Wasatch Front Regional Council

2023-2028 Transportation Improvement Program (TIP) (Amendment Nine)

Board Modification

New Project

Statewide

County	Sponsor	Facility	PIN	Project Location	Concept/ Type of Improvement	Funding Source	Project Estimated Cost	Currently Funded Amount	Action	Funding Amount	Year
Statewide	UDOT	Var	20391	FY 23-24 Employee Development Funds for Training, Education and Workforce Development	Surface transportation workforce development, training, and education	Statewide_TSP (Statewide Transportation Solutions Program)	$600,000		*New Project*	**$600,000**	2023-2024

The Infrastructure Investment and Jobs Act (IIJA), authorizes a State DOT to obligate funds for transportation workforce development, training, and education. Funds may be used for surface transportation workforce development, training, and education including: Tuition, employee professional development (e.g. training programs), student internships, apprenticeships, career opportunities for on-the-job training, and education activities, including outreach, to develop interest and promote participation in surface transportation careers.
The Employee Development group within UDOT proposes the following targets for this project: Strategic Workforce Planning, Recruitment, Engagement and Skill Development, Knowledge Management, Career Path Development, Career Enhancement, Development and Performance Management, Assessment, and Evaluation, and Leadership Development and Succession Planning.

Statewide	UDOT	Statewide Var	New	Weigh-in-motion (WIM)	Install weigh-in-motion (WIM) stations at strategic locations through out the State	NHFP (National Highway Freight Program)	$4,710,000	$0	*New Project*	**$4,710,000**	2023-2024

Vehicle weight is a critical data input in pavement design and has historically been collected by weigh-in-motion (WIM) stations. UDOT has been relying on national default weight data and WIM sites maintained by the Motor Carrier Division for the information needed in pavement design. However, for UDOT to meet current FHWA requirements, additional WIM sites will need to be installed. UDOT plans to install 20 stations as part of future project scopes of work by strategically placing them in project locations that will fulfill the federal requirement and get the best use for UDOT and UDOT partners.

Salt Lake/ West Valley Urban Area

County	Sponsor	Facility	PIN	Project Location	Concept/ Type of Improvement	Funding Source	Project Estimated Cost	Currently Funded Amount	Action	Funding Amount	Year
Salt Lake	UDOT	Big & Little Cottonwood Canyons	New	Enhanced Bus, Tolling, Mobility Hub & Bus Stops - Big & Little Cottonwood Canyons	Project to provide enhanced bus service, tolling, a mobility hub and resort bus stops for Big & Little Cottonwood Canyons.	One Time General Fund Legislative Appropriation	$192,000,000	$0	*New Project*	**$100,000,000**	2023-2024
						CCTIF (Cottonwood Canyon Transportation Investment Funding)				**$50,000,000**	
						Rec HotSpot Funds				**$42,000,000**	

In the General Session of the 2023 Utah Legislature, Lines 4022-4026 from Senate Bill 002, directed the Department of Transportation to fund a project to provide enhanced bus service, tolling, a mobility hub, and resort bus stops for Big & Little Cottonwood Canyons. The current funding would fund the majority of the total project cost estimate, currently at $250,000,000. The Department plans to split this funding into smaller projects to better manage the scope (see below).

On May 25, 2023 the WFRC Regional Council approved the 2023-2050 Regional Transportation Plan. Among the many important and valuable projects included in the Plan are the projects identified in the preferred alternative of the Little Cottonwood Canyon Environmental Impact Statement. The authorization of funding by the Legislature and the approval of the Plan allows the above projects to be amended into the 2023-2028 Transportation Improvement Program.

The Legislature directed $100,000,000 from one-time General Funding and $50,000,000 from the Cottonwood Canyons Transportation Investment Fund be spent on these projects. The intent is to use the $150M directed by the Legislature plus $42M from the previously authorized Recreational Hot Spots Program to fund the Mobility Hub, the LCC-specific work, and a significant portion of the BCC-specific work. Current cost estimates include: Mobility Hub at the Gravel Pit $80M; LCC Bus $60M, LCC Bus Stops $10M, LCC Tolling Equipment $5M; BCC Bus $75M, BCC Bus Stops $10M, BCC Tolling Equipment $5M. There is approximately $53M in additional funding needed to complete the BCC-specific work.

UDOT Statewide – Employee Development

Funds for Training, Education and Workforce Development

New Funding
$ 500,000
- - -
Total Project Cost Estimate
$ 500,000

Employee Development Group proposes Targets for this project;

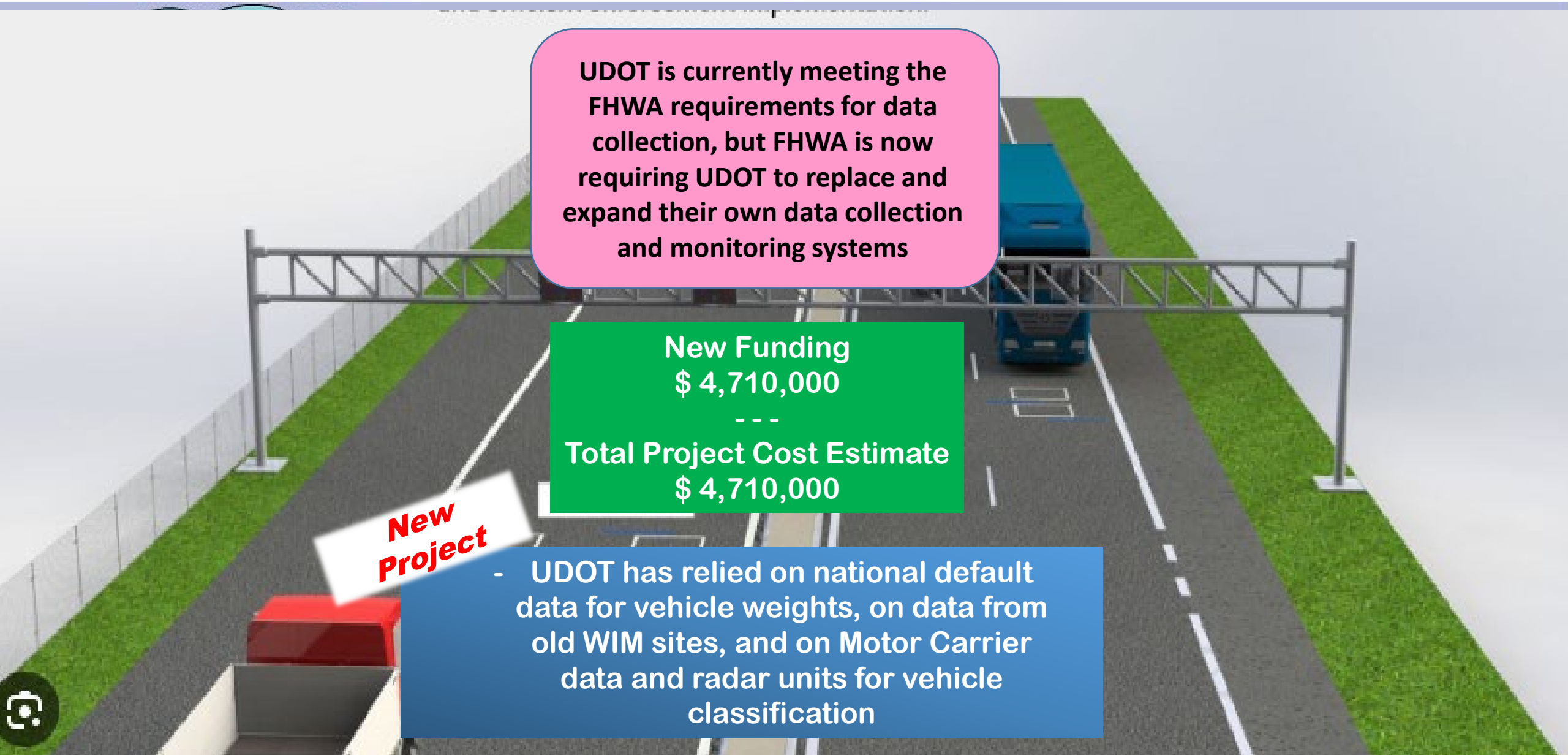
- **Strategic Workforce Planning**
- **Recruitment**
- **Skill Development**
- **Knowledge Management**
- **Career Path Development**
- **Career Enhancement**
- **Leadership Development**

New Project

- Employee Professional Development (e.g. training programs)
- Student Internships
- Apprenticeships
- Career Opportunities (for on the job training)
- Education Activities & Outreach

UDOT Statewide – Weigh-in-motion (WIM)

Install weigh-in-motion (WIM) stations at strategic locations through out the State



UDOT is currently meeting the FHWA requirements for data collection, but FHWA is now requiring UDOT to replace and expand their own data collection and monitoring systems

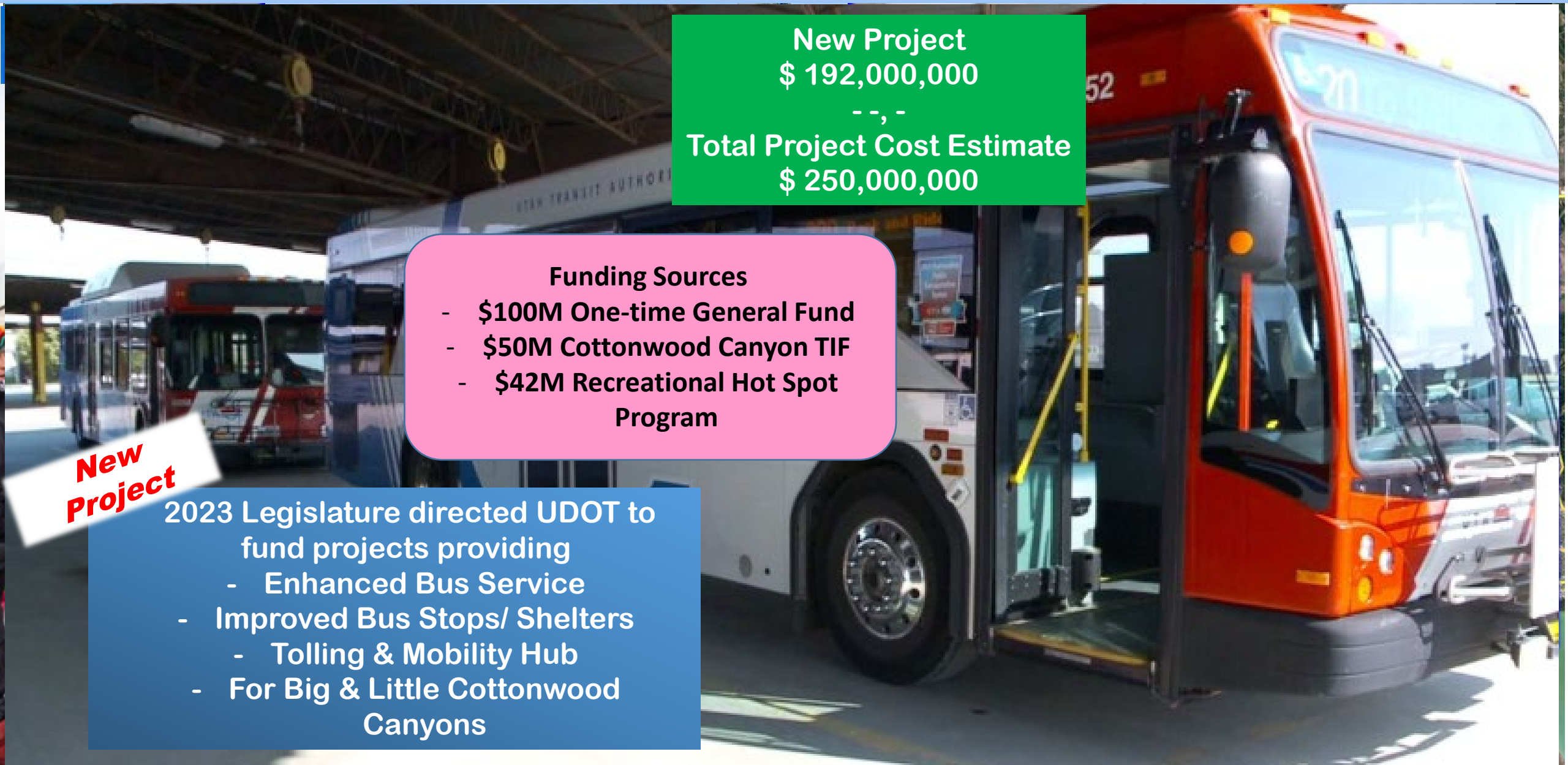
New Funding
$ 4,710,000
- - -
Total Project Cost Estimate
$ 4,710,000

New Project

- **UDOT has relied on national default data for vehicle weights, on data from old WIM sites, and on Motor Carrier data and radar units for vehicle classification**

Salt Lake County – Big & Little Cottonwood Canyons

Construct Grade Separated Interchanges at the Existing Intersections



New Project
$ 192,000,000
- -, -
Total Project Cost Estimate
$ 250,000,000

Funding Sources
- **$100M One-time General Fund**
- **$50M Cottonwood Canyon TIF**
- **$42M Recreational Hot Spot Program**

New Project

2023 Legislature directed UDOT to fund projects providing
- **Enhanced Bus Service**
- **Improved Bus Stops/ Shelters**
- **Tolling & Mobility Hub**
- **For Big & Little Cottonwood Canyons**

2023-2028 Transportation Improvement Program (TIP) (Amendment Nine)

Board Modification

New Project

Salt Lake\ West Valley Urban Area

Salt Lake	Kearns	4700 South	21130	4700 South; 5400 West to 5600 West	Reconstruct and Widen Roadway including Bike Lanes and Sidewalk	Federal Consolidated Appropriations Act, 2023 LOCAL_GOVT Local Government Funds	$2,145,232	$2,000,000 $145,232	***New Project***	**$2,000,000** **$145,232**	2023

The scope of the 4700 South; 5400 West to 5600 West project will reconstruct the existing roadway, widen the roadway to provide two lanes in each direction with a center turn lane, add bike lanes in both directions of travel, and add sidewalk in gap areas. In 2021 this portion of the original project 4700 South from 4000 West to 5600 West, (PIN 11085) was pulled out to allow coordination with Union Pacific Railroad and obtain the necessary agreements. This project was recently awarded $2M from the Federal Consolidated Appropriations Act, 2023 and with the project funding also includes the required match from Kearns Township.

Salt Lake	UDOT	Cottonwood Canyon	21097	Cottonwood Canyon Variable Message Signs	Construct 3 Variable Message Signs	Rec HotSpot Funds	$3,200,000	$0	***New Project***	**$3,200,000**	2023-2024

The Cottonwoods Canyon Variable Message Signs project would install three variable message signs (VMS). Two VMS signs will be placed on southbound SR-190, one for Big Cottonwood Canyon and the other for Little Cottonwood Canyon. The third VMS sign will be placed on eastbound SR-209 (9400 S) near 1700 E. The purpose of the project is to inform the traveling public of the following conditions: Congestion, Closures, Crashes/Incidents, Road conditions, Special Events, Parking conditions

County	Sponsor	Facility	PIN	Project Location	Concept/ Type of Improvement	Funding Source	Project Estimated Cost	Currently Funded Amount	Action	Funding Amount	Year
Salt Lake	UDOT	I-215	21161	I-215 at Indiana Avenue and also at the I-80 Interchange	I-215 Structures Deck Repairs	Regiion Two_TSP (Statewide Transportation Solutions Program)	$4,000,000	$0	***New Project***	**$4,000,000**	2023-2024

This past winter significant potholes have appeared on several structures on I-215 at Indiana Avenue and also at the I-80 Interchange. UDOT Maintenance crews have been installing temporary patches in the asphalt overlays, but more permanent repairs are needed into the structural decks.

Salt Lake	UDOT	Bridge 035100F 035107F	21148	- 200 South over the Jordan River - 1500 West 650 North over the Jordan River	Replace two locally owned bridges in Salt Lake City	New BFP (Bridge Formula Program)	$14,400,000	$0	***New Project***	**$14,400,000**	2023-2024

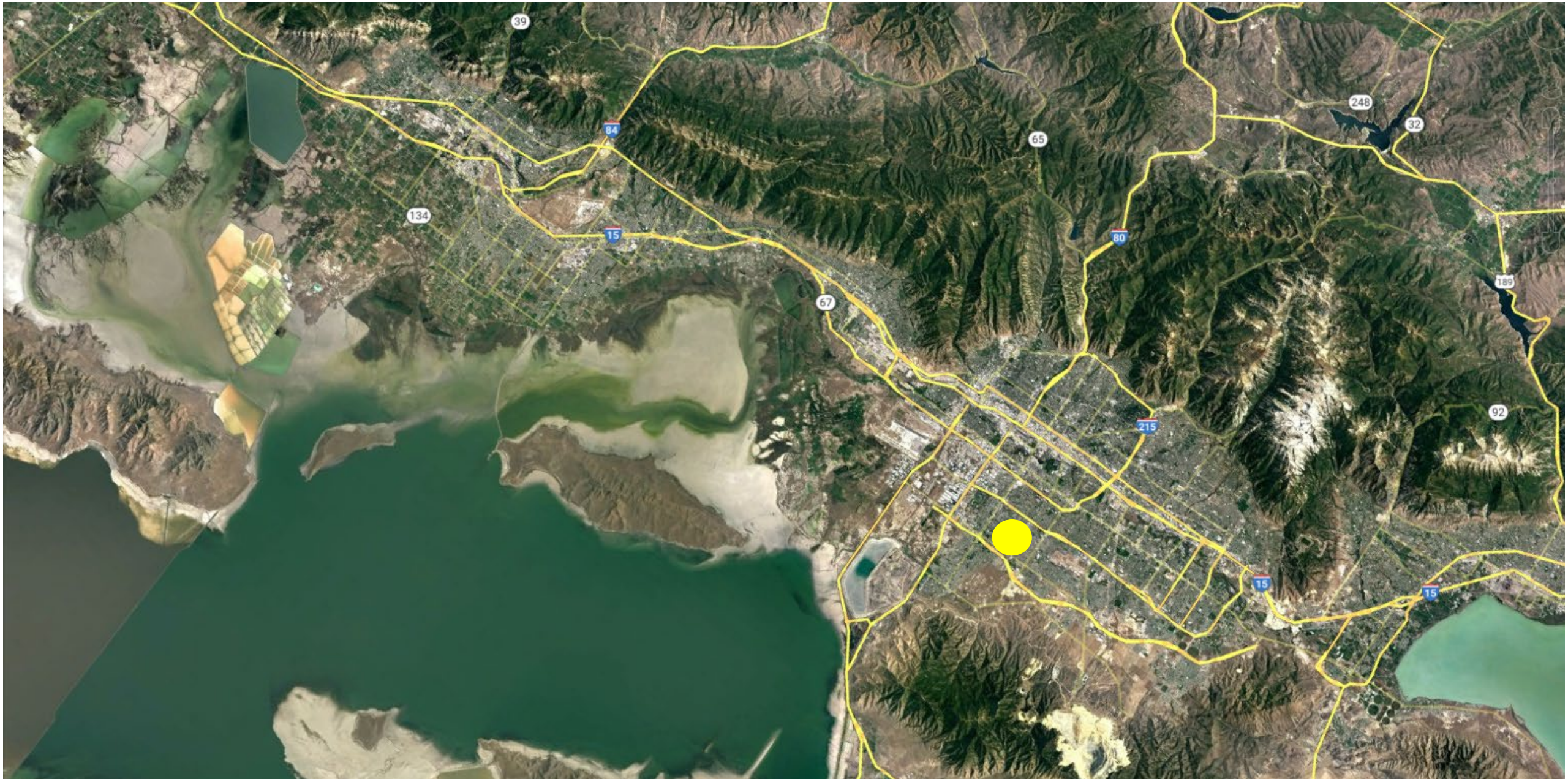
The proposed scope of this project is to perform full bridge replacements of structures 035100F and 035107F. The existing structures are currently in low-fair and poor condition, respectively, and are located on the Federal Aid Highway System. Therefore, this project will require a local agency match under the BFP. Salt Lake City is in support of the project and is able to provide the necessary match. Both bridges are on the approved B ridge Formula Program Structure List

Ogden/ Layton Urban Area

County	Sponsor	Facility	PIN	Project Location	Concept/ Type of Improvement	Funding Source	Project Estimated Cost	Currently Funded Amount	Action	Funding Amount	Year
Davis & Weber	UDOT	West Davis	21158	West Davis (SR-177); 1800 North to 5500 S. Environmental Analysis	Environmental study on the West Davis Highway from 1800 North in Clinton to 5500 South in Roy.	ST_TIF (Transportation Investment Funds)	$5,000,000		***New Project***	**$5,000,000**	2023-2024

In the 2023 Utah General Legislative Session, SB002 directed the Department to complete an environmental analysis on the West Davis Corridor from 1800 North in Clinton to 5500 South in Roy. This project will evaluate alternatives in regard to extending the West Davis Highway north to 5500 South.

Salt Lake – Kearns and West Valley City – 4700 South; 5400 West to 5600 West – Reconstruct w/ Minor Widening
Reconstruct and Widen Existing Roadway Including Bike Lanes and Sidewalk



Salt Lake – Kearns and West Valley City – 4700 South; 5400 West to 5600 West – Reconstruct w/ Minor Widening
Reconstruct and Widen Existing Roadway Including Bike Lanes and Sidewalk

Salt Lake County – Cottonwood Canyon Variable Message Signs

Construct 3 Variable Message Signs

New Project Funding
$3,200,000
- - -
Total Project Cost Estimate
$3,200,000

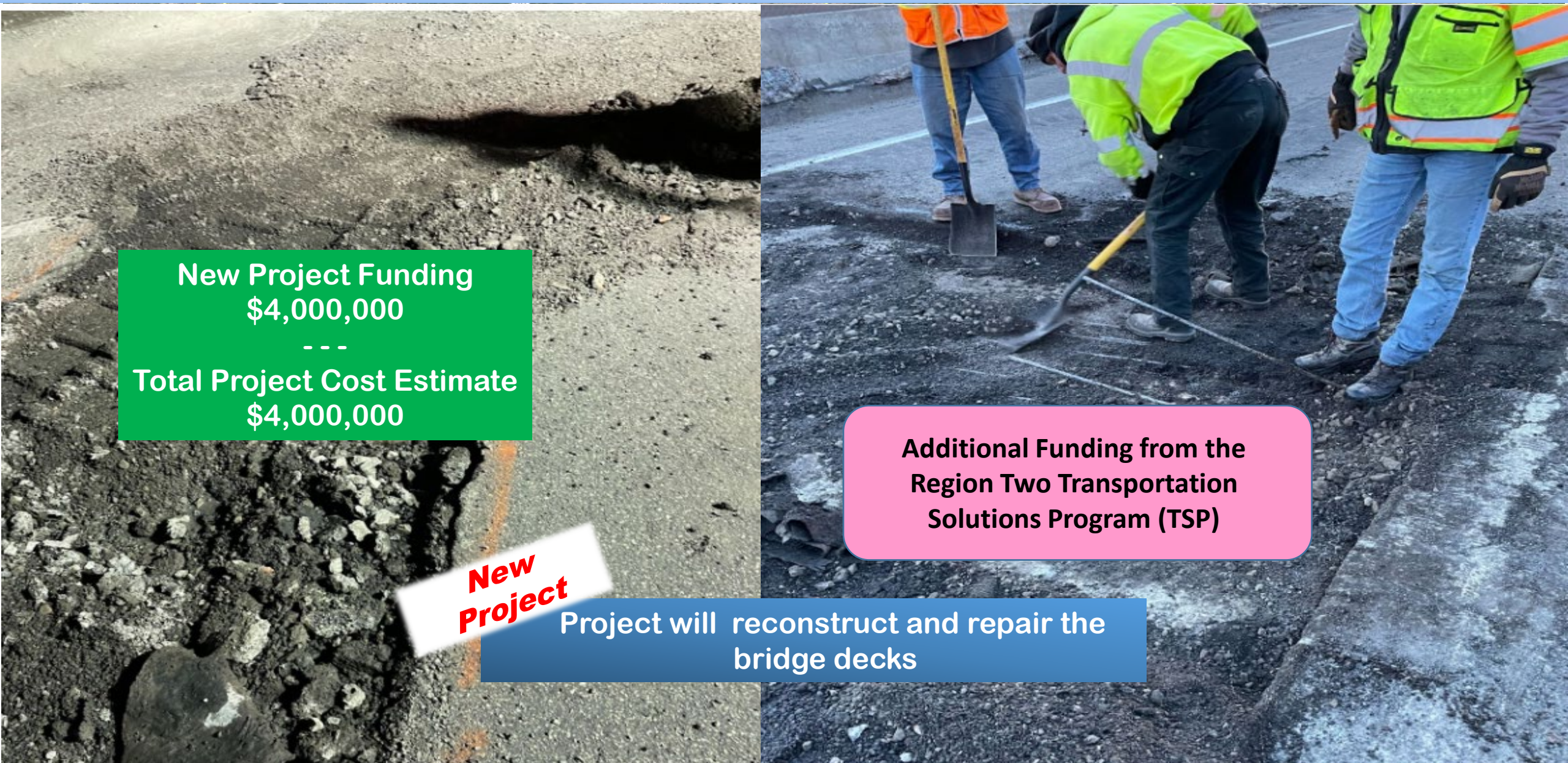
New Project

Purpose of the Signs is to Inform the Traveling Public of Canyon Conditions with
- **Congestion**
- **Closures**
- **Crashes/ Incidents**
- **Road Conditions**
- **Special Events**
- **Parking Conditions**

Additional Funding from the Recreational Hot-Spot Program Funds

Salt Lake County – I-215 at Indiana Ave & also the I-80 Interchange

I-215 Structures Deck Repairs



New Project Funding
$4,000,000
- - -
Total Project Cost Estimate
$4,000,000

Additional Funding from the Region Two Transportation Solutions Program (TSP)

New Project

Project will reconstruct and repair the bridge decks

Salt Lake County – Replace 2 Locally Owned Bridges in Salt Lake

200 South Over Jordan River & 1500 West/ 650 North Over Jordan River

Funding Available from the Bridge Formula Program (BFP) Salt Lake City will provide the Matching Funds

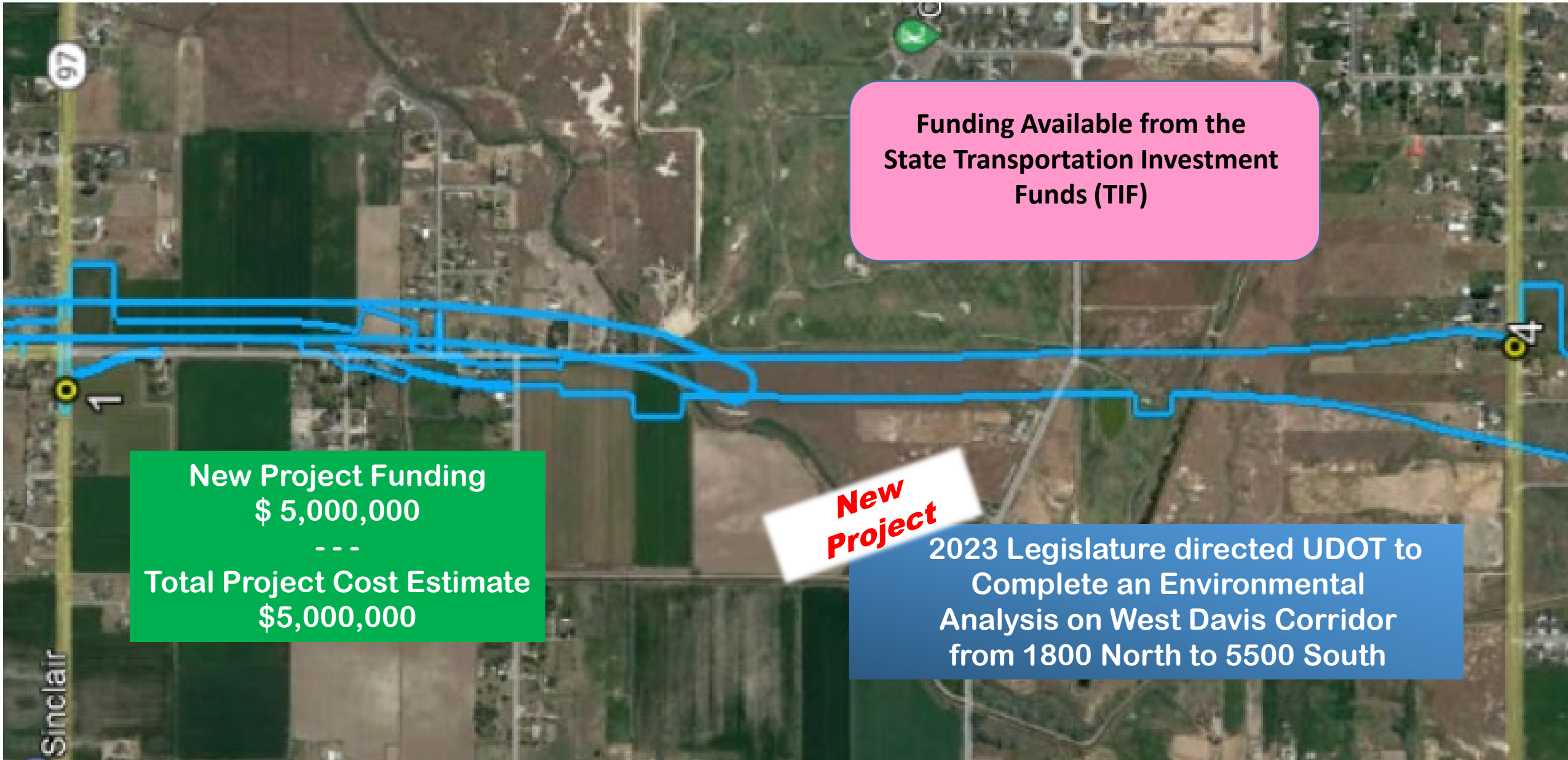
New Project Funding
$14,400,000
- - -
Total Project Cost Estimate
$14,400,000

New Project

Project will perform full bridge replacements.

Davis/ Weber Counties – West Davis Environmental Study

Environmental study on the West Davis Highway from 1800 North in Clinton to 5500 South in Roy.



2023-2028 Transportation Improvement Program (TIP) (Amendment Nine)

Board Modification

Additional Funding & Scope Change

Ogden/ Layton Urban Area

County	Sponsor	Facility	PIN	Project Location	Concept/ Type of Improvement	Funding Source	Project Estimated Cost	Currently Funded Amount	Action	Funding Amount	Year
Davis	UDOT	West Davis Hwy (SR-177)	17429	West Davis Hwy (SR-67); 500 South to I-15	Remove 1.5" Hot Mix Asphalt (HMA) and replace with 2" Stone Matrix Asphalt (SMA)	STP_FLX_ST (Surface Transportation Program - Flexible (Any Area) Statewide))	$15,223,000	$654,313	*Additional Funding*		2023
						HSIP (Highway Safety Improvement Program)		$0		**$1,223,000**	
						ST_TIF_PRES (TIF Funds Dedicated to Preservation)		$7,345,687		**$6,000,000**	

The project scope is to remove 1.5" of HMA and replace it with 1.5" of SMA. During a recent project evaluation, the project team increased the recommended pavement application from 1.5" to 2" of SMA. This will add more structural support to extend pavement life and reduce rutting in the pavement. Additionally, a future safety project is planned to add sinusoidal rumble strips to this section of roadway. To reduce interruption to the public and take advantage of project efficiencies, Traffic and Safety proposes to add funding and scope to the current project.

Weber	UDOT	SR-97	16391	5600 South (SR-97) & I-15 and widening of 5600 South	Reconfigure and reconstruct the 5600 South interchange, reconstruct a portion of I-15, and widen 5600 South from I-15 to SR-108.	ST_TIF (Transportation Investment Funds)	$376,150,000	$236,150,000	*Additional Funding*	**$140,000,000**	2023-2024

The scope of this project is to reconfigure and reconstruct the 5600 South interchange, reconstruct a portion of I-15, and widen 5600 South from I-15 to SR-108. The current project estimate was completed in 2019 and was based on a preliminary design in the Environmental Assessment (EA). The work also requires a realignment of the Davis and Weber canal. The proposed funding request breakdown is as follows: Construction Inflation (6.1% annual) - $78,000,000, ROW Inflation - $25,000,000, Additional Material Quantities - $30,000,000, DWCC Canal - $7,000,000

Additional Funding

Salt Lake / West Valley Urban Area

County	Sponsor	Facility	PIN	Project Location	Concept/ Type of Improvement	Funding Source	Project Estimated Cost	Currently Funded Amount	Action	Funding Amount	Year
Salt Lake	UDOT	Bangerter Hwy	14415	Bangerter Three Interchanges	Construct Grade Seperated Intersections	ST_TIF (Transportation Investment Funds)	$234,641,016	$233,041,016	*Additional Funding*	**$1,600,000**	2024

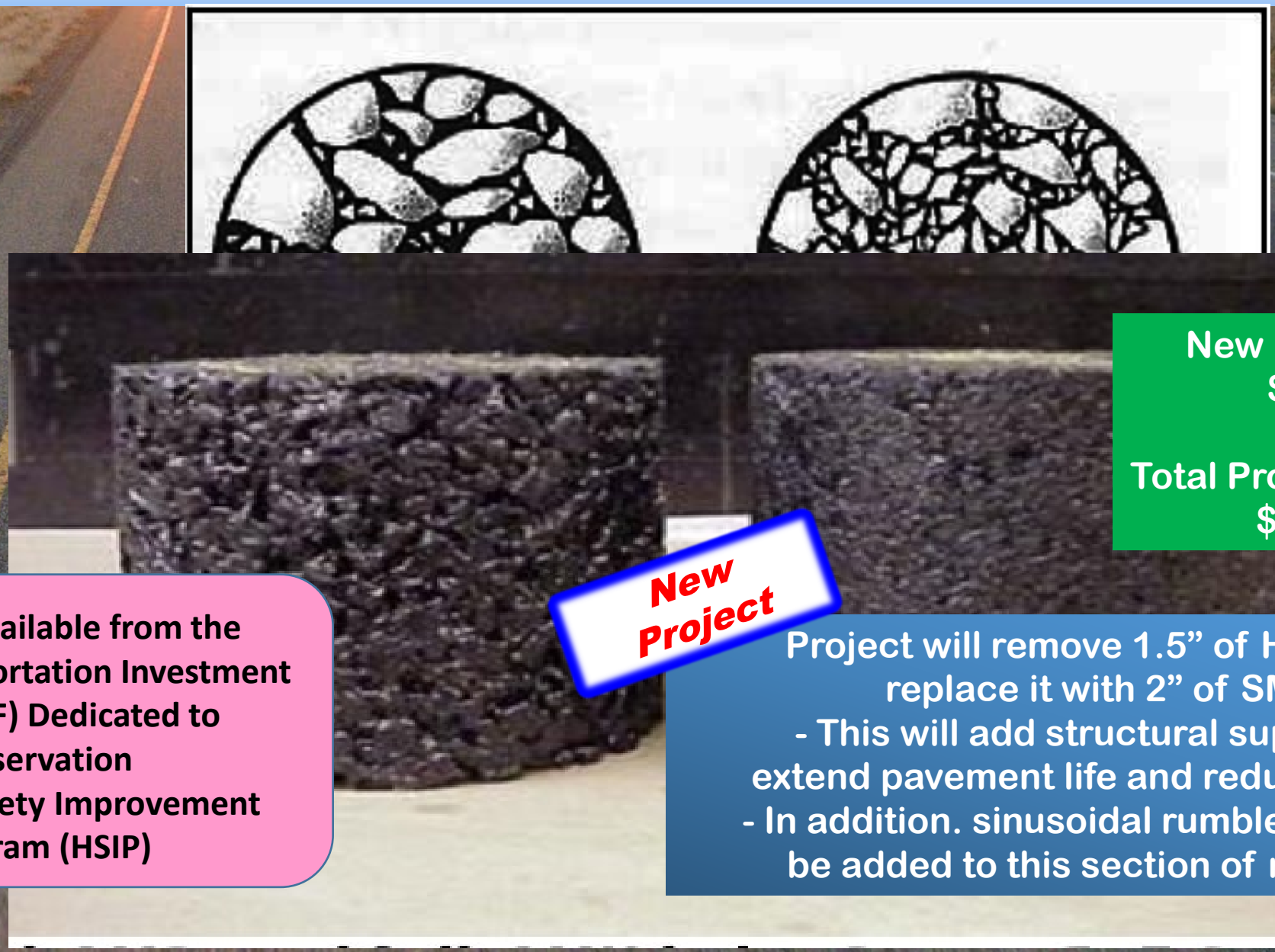
The scope of the Bangerter Three Interchanges project was to convert three at grade intersections on Bangerter Highway to grade separated interchanges at 6200 South, 10400 South and 12600 South. Region Two is requesting the additional funding to address the overruns on right-of-way acquisitions costs.

Salt Lake	UDOT	FrontRunner	New	FrontRunner Station at Point of the Mountain & Double-Tracking	Project to build a new FrontRunner Station at The Point of the Mountain and double-track necessary sections of the FrontRunner commuter rail system	One Time General Fund Legislative Appropriation	$400,000,000	$0	*Additional Funding*	**$200,000,000**	2023-2024

In the General Session of the 2023 Utah Legislature, Lines 4012-4016 from Senate Bill 002, the Legislature directed the Department of Transportation to program funding in the amount of $200,000,000 for a new Frontrunner station at Point of the Mountain and associated double-tracking. The estimated total project cost is $400,000,000.

Davis County – Legacy Highway (SR-67)

500 South (West Bountiful) to I-15 (Farmington) – Pavement Rehabilitation



New Project Funding
$ 7,223,000
- - -
Total Project Cost Estimate
$ 15,223,000

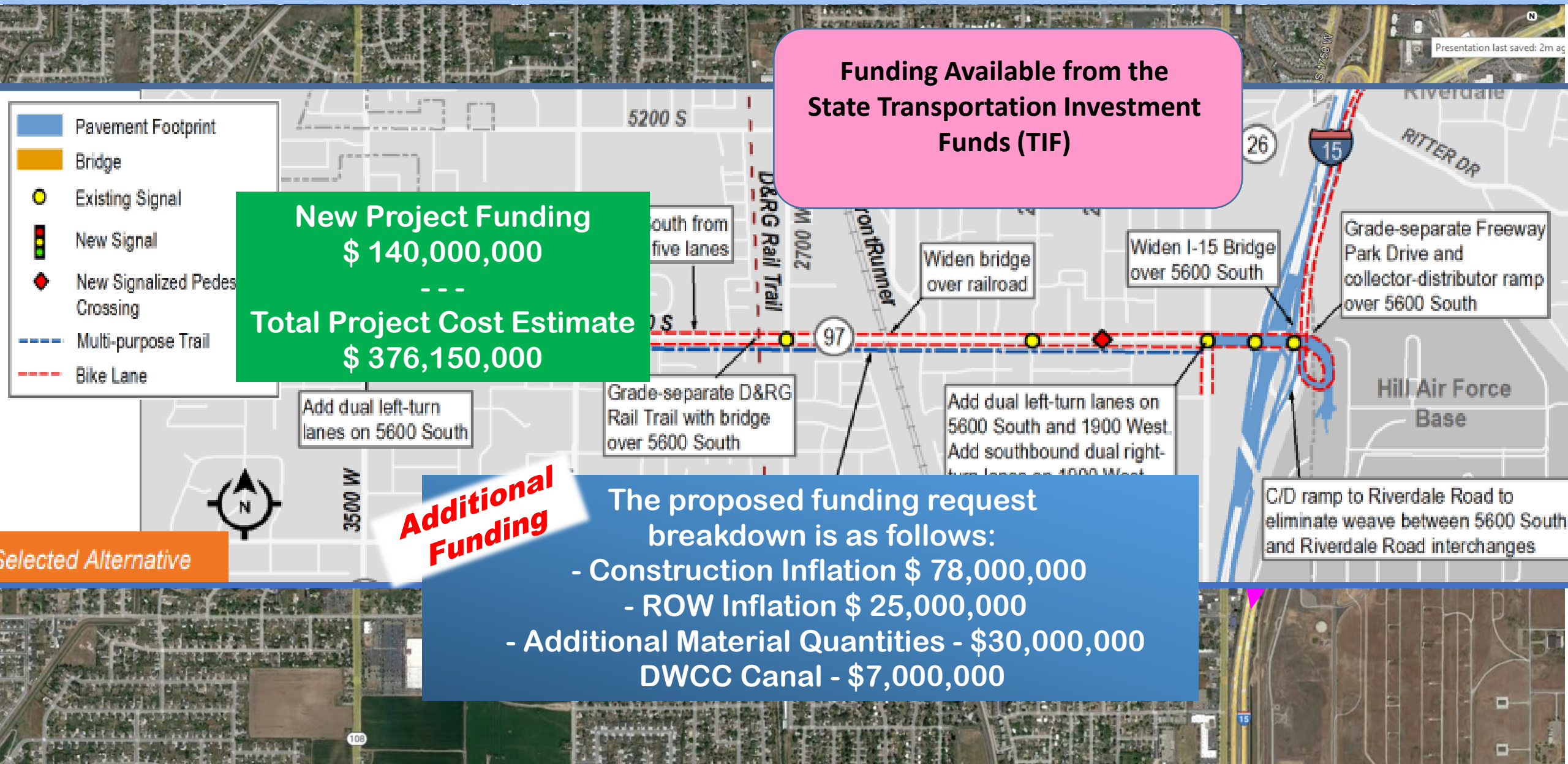
New Project

Funding Available from the
- State Transportation Investment Funds (TIF) Dedicated to Preservation
Highway Safety Improvement Program (HSIP)

Project will remove 1.5” of HMA and replace it with 2” of SMA
- This will add structural support to extend pavement life and reduce rutting
- In addition. sinusoidal rumble strips will be added to this section of roadway

Weber County – 5600 South (SR-97) & I-15 and widening of 5600 South

Reconfigure and reconstruct the 5600 So Interchange, reconstruct a portion of I-15, and widen 5600 South from I-15 to SR-108.



Funding Available from the State Transportation Investment Funds (TIF)

New Project Funding
$ 140,000,000
- - -
Total Project Cost Estimate
$ 376,150,000

Additional Funding

The proposed funding request breakdown is as follows:
- Construction Inflation $ 78,000,000
- ROW Inflation $ 25,000,000
- Additional Material Quantities - $30,000,000
DWCC Canal - $7,000,000

Salt Lake – Bangerter Highway Intersections to Interchanges
6200 South, 10400 South, and 12600 South

Additional Funding

The proposed funding request will address the overruns on right-of-way acquisition cost

Additional Funding from Transportation Investment Funds (TIF)

Additional Funding
$ 1,600,000

Total Project Cost
Estimate $ 234,641,016

Salt Lake County - FrontRunner / Point of the Mountain

FrontRunner Station at Point of the Mountain & Double-Tracking

2023-2028 Transportation Improvement Program (TIP) (Amendment Nine)

Board Modification

Additional Funding

Ogden\ Layton Urban Area

County	Sponsor	Facility	PIN	Project Location	Concept/ Type of Improvement	Funding Source	Project Estimated Cost	Currently Funded Amount	Action	Funding Amount	Year
Davis	Farmington	SR-106	16933	Main Street (SR-106); Park Lane to Shepard Lane	Widen roadway to include curb, gutter, and sidewalk	STP_URB_O/L (Surface Transportation Program - Urban Area Ogden\ Layton (WFRC))	$8,000,000	$3,905,591	***Additional Funding***	**$3,000,000**	2024
						LOCAL_GOVT Local Government Funds		$368,609	***Additional Funding***	**$725,800**	

The project will widen the road, construct curb and gutter, fix drainage issues, and add sidewalks on both sides. As the design has progressed it became evident that the programmed amount would not be sufficient to complete the project. Contributing factors for the cost increase include, additional right of way (ROW) necessary to address grade issues from the existing asphalt to the existing homesfor 51 properties, extensive complications tying in driveways due to road geometry, complications with existing drainage required a new storm drain to be designed and installed, and inflation of construction cost and materials. Farmington City has committed to pay an additional $725,800 and any additional funds necessary beyond the additional $3,000,000 in STP funds requested.

Project Withdraw

Ogden/ Layton Urban Area

County	Sponsor	Facility	PIN	Project Location	Concept/ Type of Improvement	Funding Source	Project Estimated Cost	Currently Funded Amount	Action	Funding Amount	Year
Davis	Farmington	Commerce Drive	18807	Commerce Drive Road; Burke Lane to 950 North	New construction of 5-Lane roadway with curb, gutter, sidewalk, ADA crossings, bike lanes, and utility lines.	STP_URB_O/L (Surface Transportation Program - Urban Area Ogden\ Layton (WFRC))	$8,122,500	$3,000,000	***Return Funds to Program***	**$3,000,000**	2024

Commerce Drive is a major collector road connecting Park Lane to the new WDC interchange at 950 North and the Shepard Lane interchange on I-15. Farmington has found other opportunities and successfully pursued alternative methods of funding for this portion of Commerce Drive. Farmington is formally requesting to withdraw the project and return the funds to the STP program.

Farmington City – SR-106 (Main Street) East Side – Reconstruct & Minor Widening

Project Type – Reconstruction

Park Lane to Shepard Lane – *(0.61 miles)*

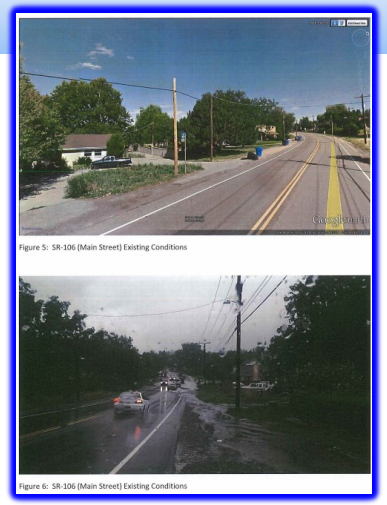


Figure 5: SR-106 (Main Street) Existing Conditions

Figure 6: SR-106 (Main Street) Existing Conditions

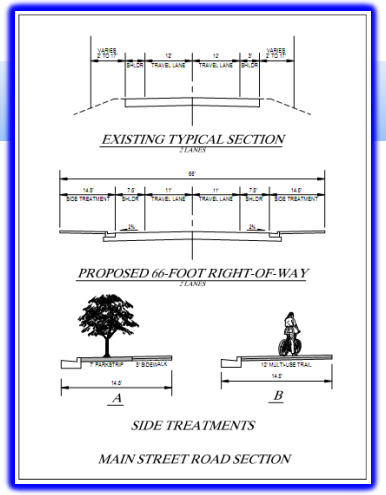



Figure 3: SR-106 (Main Street) Existing Conditions

Figure 4: SR-106 (Main Street) Existing Conditions

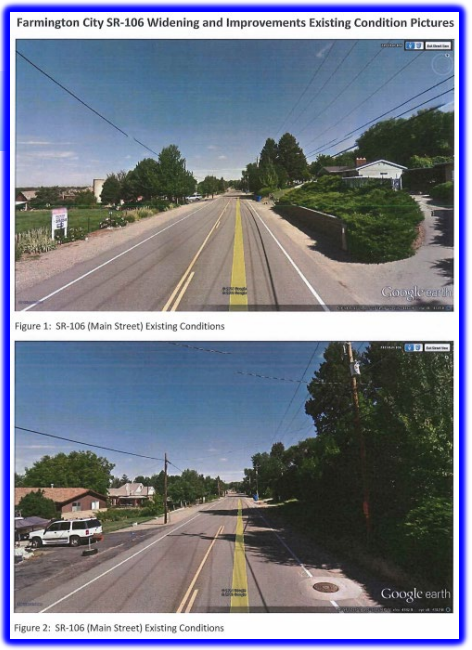


Figure 1: SR-106 (Main Street) Existing Conditions

Figure 2: SR-106 (Main Street) Existing Conditions


Existing Conditions

Project Cost – $ 1,986,400

Funds Request – $ 1,851,921

The proposed project is intended to improve drainage and add pedestrian facilities to the section of SR-106 (Farmington Main Street) between Park Lane and Shepard Lane on the east side of the road. The project will include storm drain, curb and gutter, sidewalk and pavement widening to allow for standard shoulder width.

Farmington City – SR-106 (Main Street) West side – Reconstruct & Minor Widening

Project Type – Reconstruction

Park Lane to Shepard Lane – *(0.61 miles)*

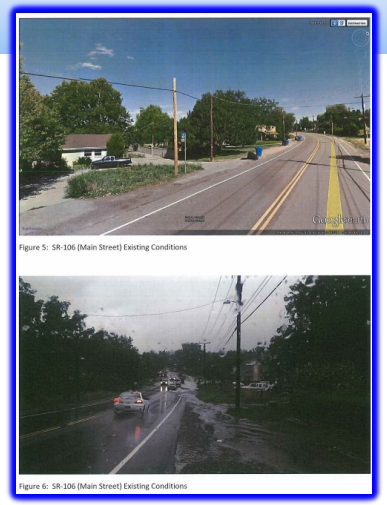


Figure 5: SR-106 (Main Street) Existing Conditions

Figure 6: SR-106 (Main Street) Existing Conditions

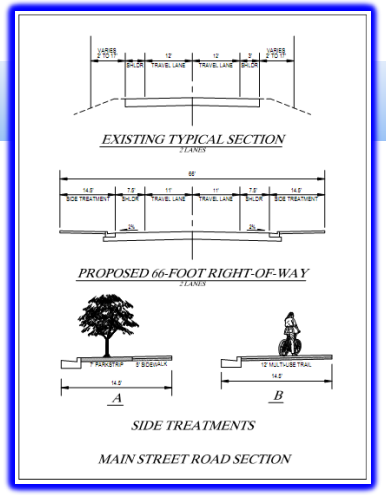



Figure 3: SR-106 (Main Street) Existing Conditions

Figure 4: SR-106 (Main Street) Existing Conditions

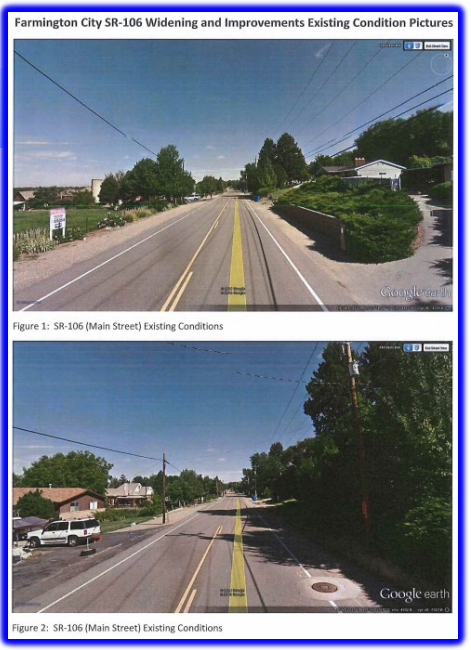


Figure 1: SR-106 (Main Street) Existing Conditions

Figure 2: SR-106 (Main Street) Existing Conditions


Existing Conditions

Project Cost – $ 2,287,800

Funds Request – $ 2,053,670

The proposed project is intended to improve drainage and add pedestrian facilities to the section of SR-106 (Farmington Main Street) between Park Lane and Shepard Lane on the west side of the road. The project will include storm drain, curb and gutter, sidewalk and pavement widening to allow for standard shoulder width.

Farmington City – SR-106 (Main Street) – Reconstruct & Minor Widening

Current Funding Status

Federal Funds = $ 3,905,591

Local Match = $ 368,609

Total = $ 4,274,200

Current Engineers Estimate $ 8,000,000

Request for Additional Funds $ 3,000,000

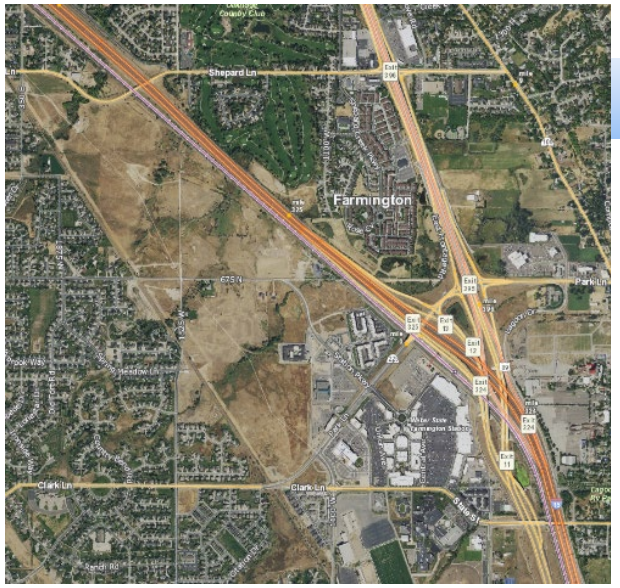
Farmington City to Cover the Project Shortfall

- Grade Issues from the Existing Asphalt to the Existing Homes
  - 51 Temporary Right of Way (ROW) Purchases
  - Tying in for Driveways More Complicated & Extensive due to Road Geometry

- Existing Drainage is Old Irrigation System Requiring New Design & Installation of Three Storm Drain Outfalls
- Inflation of Construction Cost and Materials

Farmington City – Commerce Drive – New Construction – Phase I
Project Type – Capacity

Burke Lane to 950 North – *(0.542 miles)*



Commerce Drive Road
Existing Conditions

Fig 1. 1525 West and Burk Lane Looking north west

City Request to Withdraw This Project from the Surface Transportation Program

$ 3,000,000

Project Cost – $ 8,122,500

Funds Request – $ 7,572,607

Commerce Drive is a planned 5 lane road connecting Park Lane interchange to the new I-15 interchange on Shepard Lane and the new West Davis Corridor Interchange on 950 North Street. Construction includes pavement, curb, gutter, sidewalk, ADA crossings, utility lines, and acquiring right of way.

4c - Release the Draft 2024-2029 Transportation Improvement Program (TIP) and Air Quality Conformity Analysis for Public Review and Comment

Trans Com

June 15, 2023

Ben Wuthrich

Wasatch Front Regional Council

Air Quality Memorandum - draft

REPORT NO. 41a

DATE June 15, 2023

SUBJECT CONFORMITY ANALYSIS FOR THE WFRC 2024-2029 TRANSPORTATION IMPROVEMENT PROGRAM.

ABSTRACT The Infrastructure Investment and Jobs Act (IIJA) and the Clean Air Act Amendments (CAAA) require that all regionally significant highway and transit projects in air quality non-attainment and maintenance areas be derived from a "conforming" Regional Transportation Plan and Transportation Improvement Program. A conforming Plan or Program is one that has been analyzed for emissions of controlled air pollutants and found to be within the emission limits established in the State Implementation Plan (SIP) or within guidelines established by the Environmental Protection Agency (EPA) until such time that a SIP is approved. This conformity analysis is made by the Wasatch Front Regional Council (WFRC), as the Metropolitan Planning Organization for the region, and submitted to the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) for their concurrence. This conformity analysis is being prepared according to the transportation conformity rulemakings promulgated by the Environmental Protection Agency (EPA) as of April 2012 and according to FHWA guidelines found in the IIJA legislation.

Section 93.122(g)(1) of the Transportation Conformity Rule (40 CFR part 93) states that a new TIP may be demonstrated to conform "... without new regional emissions analysis if the previous regional emissions analysis also applies to the ... TIP." Section 93.122 includes the following four conditions. First, the TIP must include all projects that must be started within the TIP time frame in order to achieve the transportation network envisioned in the plan. Second, all regionally significant projects in the TIP must be included in the regional emissions analysis. Third, the design concept and scope for TIP projects must not have changed significantly from the plan. And fourth, the previous regional emissions analysis is consistent with all conformity requirements. As discussed below, the WFRC 2024-2029 TIP meets the conditions of CFR 93.122(g)(1) and therefore conforms to the State Implementation Plan and the EPA guidelines for interim conformity for all applicable non-attainment and maintenance areas and pollutants. Therefore, all the transportation projects in southern Box Elder, eastern Tooele, western Weber, Davis, and Salt Lake Counties included in the 2024-2029 TIP are found to conform.

Wasatch Front Regional Council
41 North Rio Grande Street, Suite 103
Salt Lake City, Utah 84101

2023

January

Su	M	Tu	W	Th	F	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
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February

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Next Round

September

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October

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29	30	31				

November

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December

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17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Projects for the 2025 – 2030 TIP Process

2024-2029 WFRC TIP Public Comment Map

Open for Comments: June 25 - July 31, 2023

Legend

TIP Projects (Road, Transit, Active Transportation)

- (●) Display by Funding
- ( ) Display by Status
- ( ) Display by Anticipated Start Year

- Congestion Mitigation and Air Quality (CMAQ)
- Surface Transportation (STP)
- Transportation Alternatives (TAP)
- Other

Provide Feedback

5500 West; 5500 South to Davis Co Line

Project Type	Pavement Reconstruction
Project Status	Scoping
Forecasted Start Year	2026
Project Value	$2,471,000
Funding Source	WFRC OGDEN/ LAYTON STP
Description	Reconstruct & Widening
County	Weber
PIN	18811

Leave Comment | return to main screen

Name 50

Organization 50

Contact Information (email/phone) 50

Summary of the TAC Recommended Projects for the Surface Transportion Program (STP)			
	Project Information		Funding Amount Recommended
Sponsor	Location/ Limits	Concept/ Type of Improvements	
Salt Lake \ West Valley Urbanized Area			10
Cottonwood Heights	Fort Union Blvd Roadway; Pippen Drive to 3160 East	Project will reconstruct Fort Union Blvd from 3160 East to accomodate bike lanes on both sides of the road, as well as intersection and ADA facilities, asphalt pavement, and a new 10-ft multi-use trail along the north-east side of Fort Union.	$ 2,500,000
Draper City	Pioneer Road; 1300 East to 1650 East	The proposed project will reconstruct and widen this section of road to include 2 travel lanes, paved shoulders, curb and gutter, park strips, and sidewalks.	$ 3,000,000
Emigration Metro Township	Emigration Canyoun Roadway Safety Improvements between 5655 East to 9698 East	Construct a shared use path between Parley's trail (approximately 2000 South) to Liberty Park.	$ 3,000,000
Herriman City	13400 S Roadway Widening; 6000 West to 6400 West	This project will enhance mobility by improving and adding travel lanes, curb, gutter, bike & pedestrian facilities in both directions.	$ 3,000,000
Magna Metro Township	2700 South; 8054 West to 8000 West	Project will widen for a uniform crossection with the installation of curb, gutter and sidewalk on the north side of 2700 S providing a safe route to school for the Pleasant Green Elementary school.	$ 3,000,000
Millcreek City	2000 East; 3300 South to E. Atkin Avenue	Project will create a safer environment for all users including the reconstruction of disfunctioning curb & gutter, sidewalk, ADA ramps, enhanced bus stops, storm drain, and piping an existing irrigation ditch below grade from 3300 S SR #171 to Atkin Ave.	$ 3,000,000
Salt Lake City Corporation	900 West; North Temple to 600 North	Roadway Reconstruction including improvements to enhance transit, pedestrian, bicycle, and access to opportunities for residents	$ 3,000,000
South Jordan City	4000 W / South Jordan Parkway Intersection Improvements	Project to Improve Intersection Mobility by; - One additional through lane will be added to all 4 approaches - A second left turn lane will be added to the East & West approach - Right turn pockets will be added to the North and South approach	$ 1,500,000
West Jordan City	9000 South; 6400 West to New Bingham Highway	The project will connect 9000 South from 6400 West to its proposed connection at 6200 West (NBH). 9000 South current alignment procceds west from MVC curving southward towards Copperton. New alignment will continue the grid pattern to SR-111.	$ 2,500,000
West Valley City	7200 West; 3500 South to Copper Hill Drive	Roadway Reconstruction w/ Minor Widening including curb & gutter, sidewalk, ADA ramps, enhanced bus stops, and installation of new storm drain	$ 2,400,000
			$ 26,900,000

Farr West City – 3300 North – Round-about/ Road Widening – Phase I
Project Type - Reconstruction

3300 North between 2700 West and 2575 West – *(0.231 miles)*

$ 2,400,000

Project Cost –
$ 3,453,400

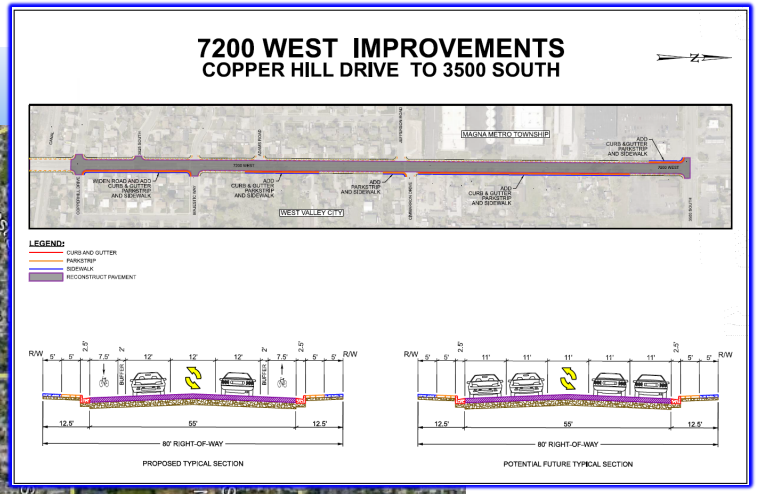
Funds Request –
$ 2,403,842

Phase 1 of this project will improve the 3300 North corridor from the western city limit at 2700 West to 2575 West and will improve the 2575 West 3300 North intersection with a new roundabout.

West Valley/ Magna – 7200 West – Reconstruct w/ Minor Widening

Project Type – Reconstruct

3500 South to Copper Hill Drive – (0.62 miles)



7200 West (Approx. 3535 South)
Facing South on the East Side

7200 West (Approx. 4029 South)
Facing South on the East Side

7200 West (Approx. 3779 South)
Facing North on the East Side

$ 2,400,000

Project Cost – $ 7,670,900

Funds Request – $ 2,435,764

This project is necessary to meet current needs, reduce flooding and to accommodate future growth in the southwest portion of West Valley City and Magna. This project will improve safety and will complete curb, gutter and sidewalk through this corridor. The user experience will be enhanced through pavement improvements.

Summary of the TAC Recommended Pr... the

Ogden City – Bike Share Program
Project Type - Transit

Various Areas in the Ogden Central Business A...

Project Cost – $ 678,500
Funds Request – $ 632,566

$ 632,51...

A bikeshare program is an alternate mode of transpo... designed for urban centers. It is a way of linking alread... place infrastructure and transit systems together. The prog... can be used by residents or visitors to the City. This program ... a way to improve air quality, and the overall health of its users.

Salt Lake City – Bike Share (GREENbike) Expansion
Project Type – Bicycle

Salt Lake City Proper – (6 sq miles)

GREENbike

$ 641,700

Project Cost – $ 690,000
Funds Request – $ 641,700

The project increases the concentration of bike share stations west of Interstate 15 and expands a robust bike share system that links commuters to regional transit and local destinations. GREENbike, the bike share agency serving Salt Lake City, reduces nearly 741,000 pounds of CO2 emissions into the airshed annually.

Sandy/ Draper – 11400... EB/WB Dual Lefts
Project Type – ...perations

UTA – Midvalley Connector – Electric Buses
Project Type – Transit

Murray, Ut Murray Station to West Valley, Ut Central Station – *(7 miles)*

$ 2,000,000

Project Cost – $ 10,500,000
Funds Requ... $ 6,0...

...TA Small Starts process plans that ... from another federal source. ...der the most recent LoNo ...STBG would strengthen ...os.

UTA – Salt Lake-On-Route Electric Bus Charging Infrastructure
Project Type – Transit

A network of high-power on-route chargers at key locations

Project Cost – $ 3,000,000
Funds Request – $ 2,796,900

$ 1,500,00...

UTA is working to acquire more all-electric buses. It is anticipated that there will be... future . A network of high-power on-route chargers at key locations enables these b... locations without concerns about a bus being limited by charge ra...

...es for th... ...of those buses

...nables electric buses to be dep...

...erns about a bus being limited by charg...

range.

$ 11,01...

UTA – Ogden-On-Route Electric Bus Charging Infrastructure
Project Type - Transit

A network of high-power on-route chargers at key locations

Project Cost – $ 1,500,000
Funds Request – $ 1,398,450

$ 1,398,450

UTA is working to acquire more all-electric buses. It is anticipated that there will be a fleet of electric buses for the future Ogden/WSU BRT. To support the all-day operation of the vehicles, on-route charging is needed to extend range. A network of high-power on-route chargers at key locations enables these buses to be deployed in more locations without concerns about a bus being limited by charge range.

11400 South & (Oak Brush Dr (605 E) -785 East) – *(0.25 miles)*

EX. BACK TO BACK B5 MEDIAN CURB

ADDITIONAL LEFT TURN LIGHT REQ'D

320' LANE TAPER

11400 SOUTH

RELOCATE EXISTING SOUTHBOUND SIGNAL POLE

$ 3,357,119

Project Cost – $ 3,603,500
Funds Request – $ 3,357,119

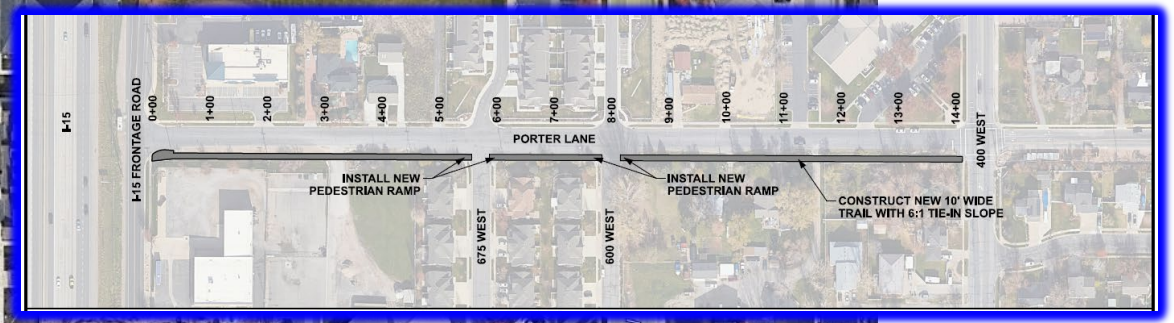
This intersection is currently operating at LOS E with eastbound queues reaching 1,000 feet, resulting ... unstable operations and delay. Warranted by funded year 2029, the intersection will be widened to accommodate dual eastbound and westbound left turns, approximately doubling the existing storage capacities.

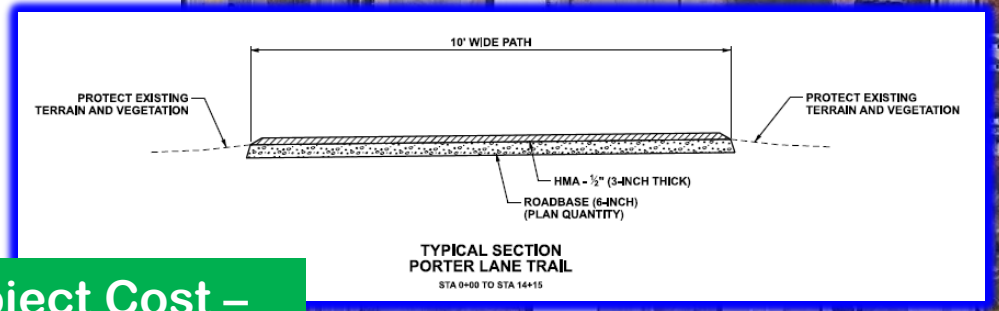
Summary of the TAC Recommended Projects for the Transportation Alternatives Program (TAP)			
	Project Information		Funding Amount Recommended
Sponsor	Location/ Limits	Concept/ Type of Improvements	
Salt Lake\ West Valley Urbanized Area			5
Herriman City	Rosecrest Bike Lane Installation	Install Buffered Bike Lanes on Rosecrest Rd from 13400 S to Mtn View Corridor.	$ 389,608
Kearns Metro Township	4220 West Sidewalk between 5415 South and 5500 South	Safe Routes to School - Construct Missing Sidewalk	$ 122,131
Millcreek	S Birch Drive; Upland Drive to 3900 South	Project will create a safer environment for all users with the construction of curb and gutter, sidewalk, and ADA ramps.	$ 758,333
West Valley City & Taylorsville	3900 South Bike Lanes	Project improves the pavement section between Redwood Road and the Jordan River, adding buffered bike lanes, a 10' trail, street lighting and connecting sidewalk.	$ 1,129,817
White City Metro Township	Sego Lily Crossing at 1300 East	The project will reconstruct the NW corner of the intersection to allow an ADA compliant ped ramp and move the school crossing there.	$ 1,033,175
			$ 3,433,064

Centerville City – Porter Lane (400 So) Multi-Use Trail – Phase I – New Trail
Project Type – Capital Improvement

400 West to South Frontage Road – *(0.26 miles)*

$ 151,250





Project Cost – $ 302,500

Funds Request – $ 151,250

Davis County will be enclosing a channel in the next year or two on the south side of the road. We would like to put in a multi-use trail to connect 400 West to the Frontage Road on top of the enclosed channel. This will be part 1 of 2. We intend to extend the trail east to Main Street soon after.

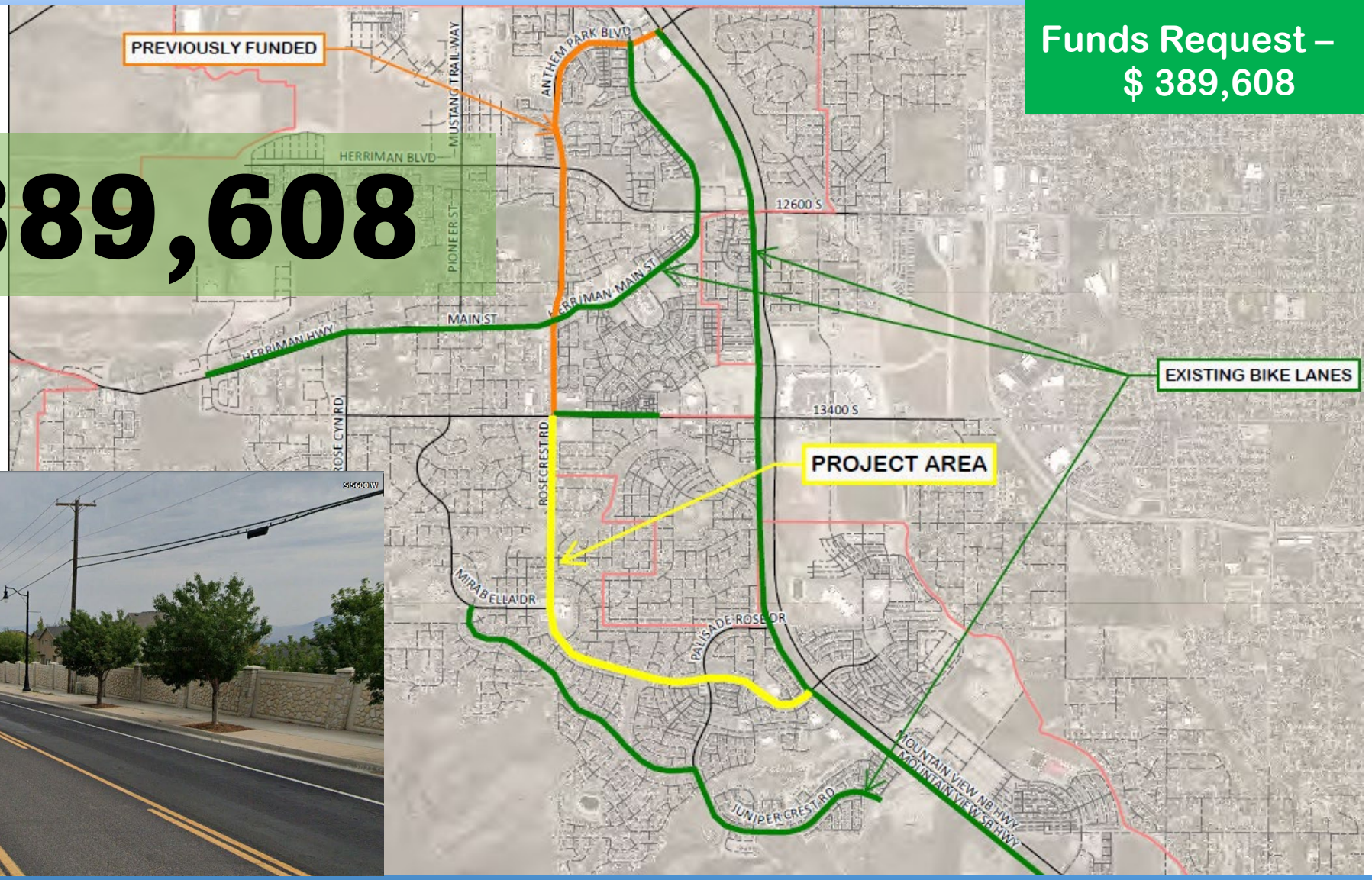
Herriman City – Rosecrest Bike Lane Installation – Bike\ Ped Facility
Project Type – Capital Improvement

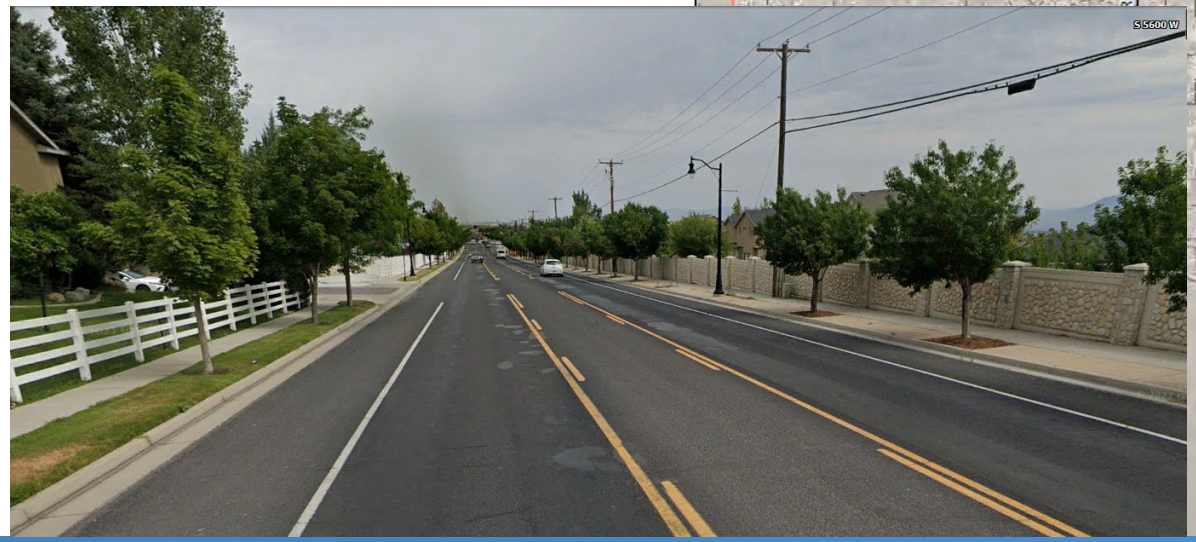
13400 South to Mountain View Corridor – *(2.5 miles)*

Project Cost – $ 417,900

Funds Request – $ 389,608

$ 389,608



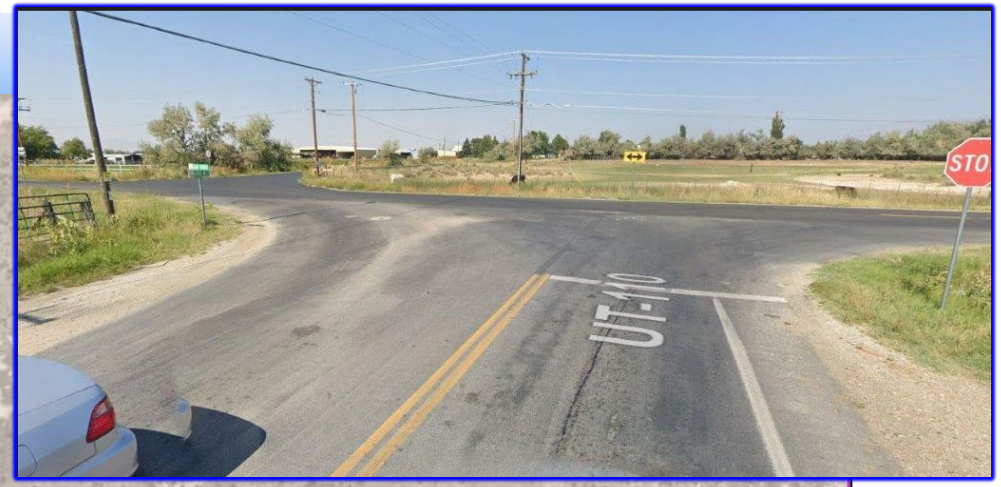


Install Buffered Bike Lanes on Rosecrest Road from 13400 South to Mountain View Corridor.

Summary of the TAC Recommended Projects for the Carbon Reduction Program (CRP)			
	Project Information		Funding Amount Recommended
Sponsor	Location/ Limits	Concept/ Type of Improvements	
Ogden \ Layton Urbanized Area			3
Roy City	Roy Municipal Building Electric Vehicle Charging Stations	Install four (4) electric vehicle charging stations at the Roy City Municipal Building and are intended to be used by Roy City Employees and residents visiting the Municipal Building.	$ 93,696
Syracuse City	Antelope Trail, Phase 1 - Antelope Drive between West Davis Corridor and the Causeway	A shared use trail will allow people to bike from existing neighborhoods to the Island, rather than drive to the existing park and ride near the booth. Additionally, this phase of trail will provide access between existing and future neighborhoods along Antelope, and provide a safe route for students biking and walking to Buffalo Point Elementary School.	$ 349,906
West Point	1800 N/4500 W Round-About	This Project will re-align two offset intersections and construct a round-about intersection to eliminate delays.	$ 1,013,690
			$ 1,457,292
Salt Lake\ West Valley Urbanized Area			3
City of Holladay	Signal Optimization Enhancements	Replace signal equipment at 19 targeted intersections to support signal optimization, reducing carbon emissions, improving travel time and updating signal timing standards.	$ 1,074,755
Cottonwood Heights	Highland Drive - Protected Trail Project	Project will construct an 8-ft asphalt trail on the east side of Highland Drive from Fort Union Blvd to Villare Ave. connecting to the trail being consturcted as part of the Highland Drive/Bengal Blvd Project.	$ 1,952,516
Utah Transit Authority (UTA)	On-Route Charging Infrastructure for 2 chargers	On-route chargers at key locations enables electric buses to be deployed in more locations without concerns about a bus being limited by charge range.	$ 1,500,000
			$ 4,527,271

West Point – 1800 North/ 4500 West – Round-about
Project Type – Operations

1800 North & 4500 West



ALIGN INTERSECTION

SIGNAL OR ROUND-ABOUT

1800 NORTH (SR37)

4500 WEST (SR110)

$ 1,013,690

Project Cost –
$ 2,087,300

Funds Request
$ 1,013,690

This is a busy intersection of two state highways. Currently the north and sound legs of the intersection are offset by about 100 ft. This project is needed to align the intersection and create a more efficient intersection to eliminate delays.

Holladay – Signal Optimization Enhancements
Project Type – Operations

Table 1: Holladay City Intersection Improvements

Holladay Boulevard / 2300 East	Phylden Ln	Replace signal cabinet
	Lincoln Lane	Replace all signal heads, LEDs, mounts
		Replace Auto LEDs
		New Cobalt controller
		Upgrade loop & video detection to radar detection
		New Cisco Switch
		Replace pedestrian button assemblies
		Replace pedestrian head assemblies
		Install 11' pedestrian pole
		Replace pedestrian LED modules
		New Power Service, RMP

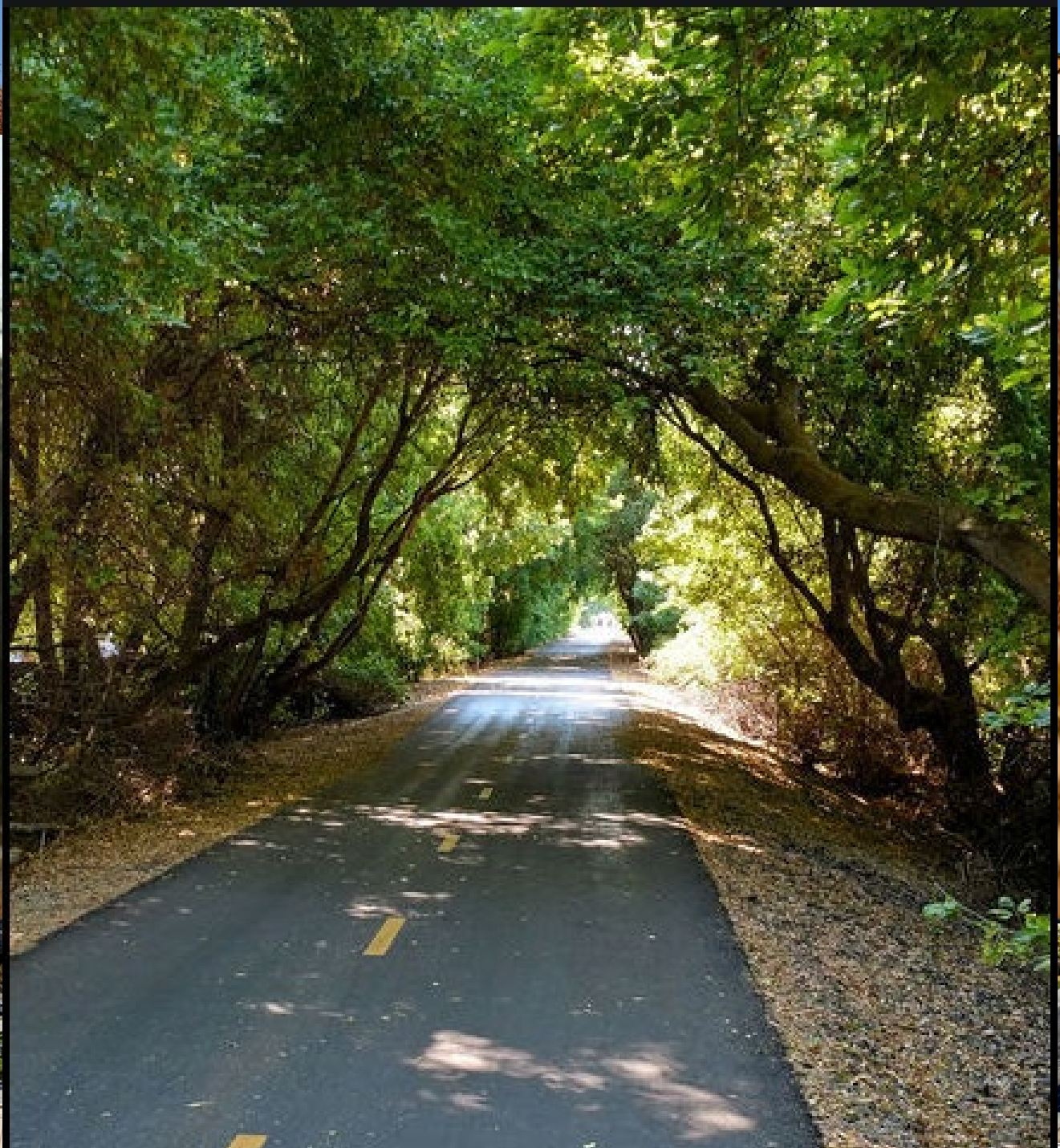
Table 1: Holladay City Intersection Improvements

Corridor	Intersections	Recommendations
3900 South	2700 East	Install snow visors on matrix radars
	2300 East	Raise cabinet foundation (Metal Extension)
	2000 East	New Cobalt signal controllers
		Replace all Auto LEDs
		New Cisco Switch
		Add 2" reflective backplate tape
Murray-Holladay Road	1945 East	Replace signal cabinet
	Viewmont	Replace signal heads, LEDs, mounts, align heads with lanes
	2200 East (Fire Station)	Replace Streetlights with LED
		New Cisco Switch
	2300 East	Replace failed loops, video/loop detection with radar
	1665 East	Replace CAT5 ped wire
		New Cobalt signal controllers
		Replace SO cord cable (signal heads)
		Replace pedestrian LEDs
		Add pedestrian striping
		Replace pedestrian button assemblies
		Replace pedestrian chirps with Audible Buttons
		Replace pedestrian pole with Streetlight & Lighting
		New power service, RMP (Rocky Mountain Power) pedestal
		New T3 cabinet junction box
		Add 2" reflective backplate tape

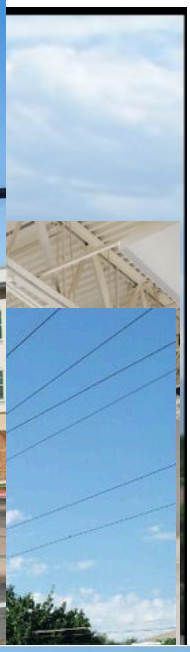
Project Cost – $ 1,152,800
Funds Request – $ 1,074,755

$ 1,074,755

As recommended in recent study completed by Holladay, signal equipment at #19 targeted intersections require replacement to support signal optimization, thus reducing carbon emissions, improving travel time and updating signal timing standards.




20TH Street




2024-2029 WFRC TIP Public Comment Map
Open for Comments: June 25 - July 31, 2023
Legend
TIP Projects (Road, Transit, Active Transportation)
Display by Funding
Display by Status
Display by Anticipated Start Year
Congestion Mitigation and Air Quality (CMAQ)
Surface Transportation (STP)
Transportation Alternatives (TAP)
Other
Provide Feedback
5500 West; 5500 South to Davis Co Line
5899 6300 W St
Hooper, Utah
View on Google Maps
Project Type
Pavement Reconstruction
Project Status
Scoping
Forecasted Start Year
2026
Project Value
$2,471,000
Funding Source
WFRC OGDEN/ LAYTON STP
Description
Reconstruct & Widening
County
Weber
PIN
18811
Leave Comment
return to main screen
Name
Organization
Contact Information (email/phone)
DAVIS
MORGAN
Salt Lake City
Farmington
Layton
Ogden

www.wfrc.org

Requested Action – To release the Draft 2023-2028 Transportation Improvement Program (TIP) and Air Quality Conformity Analysis for Public Review and Comment

NWF 2015 Ozone Moderate SIP Update

Ryan Bares

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
AIR QUALITY

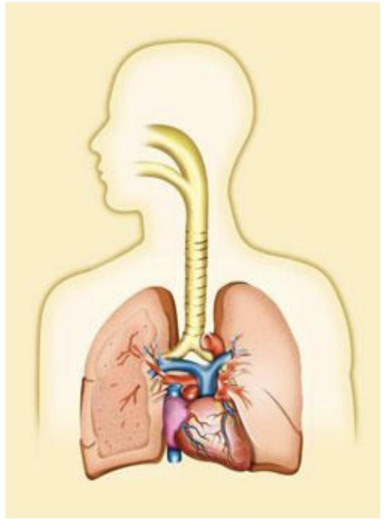
What is ozone?

NOx + VOC + Sunlight and Heat

= ozone

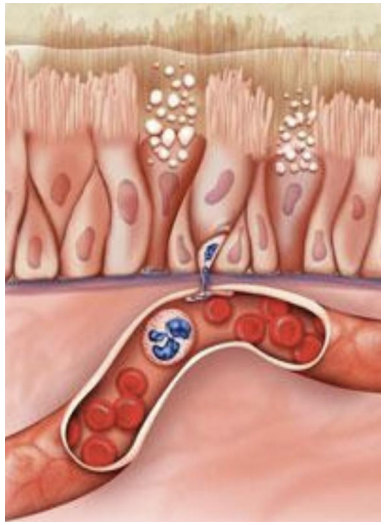
Significant human health impacts

Health Impacts of Ozone



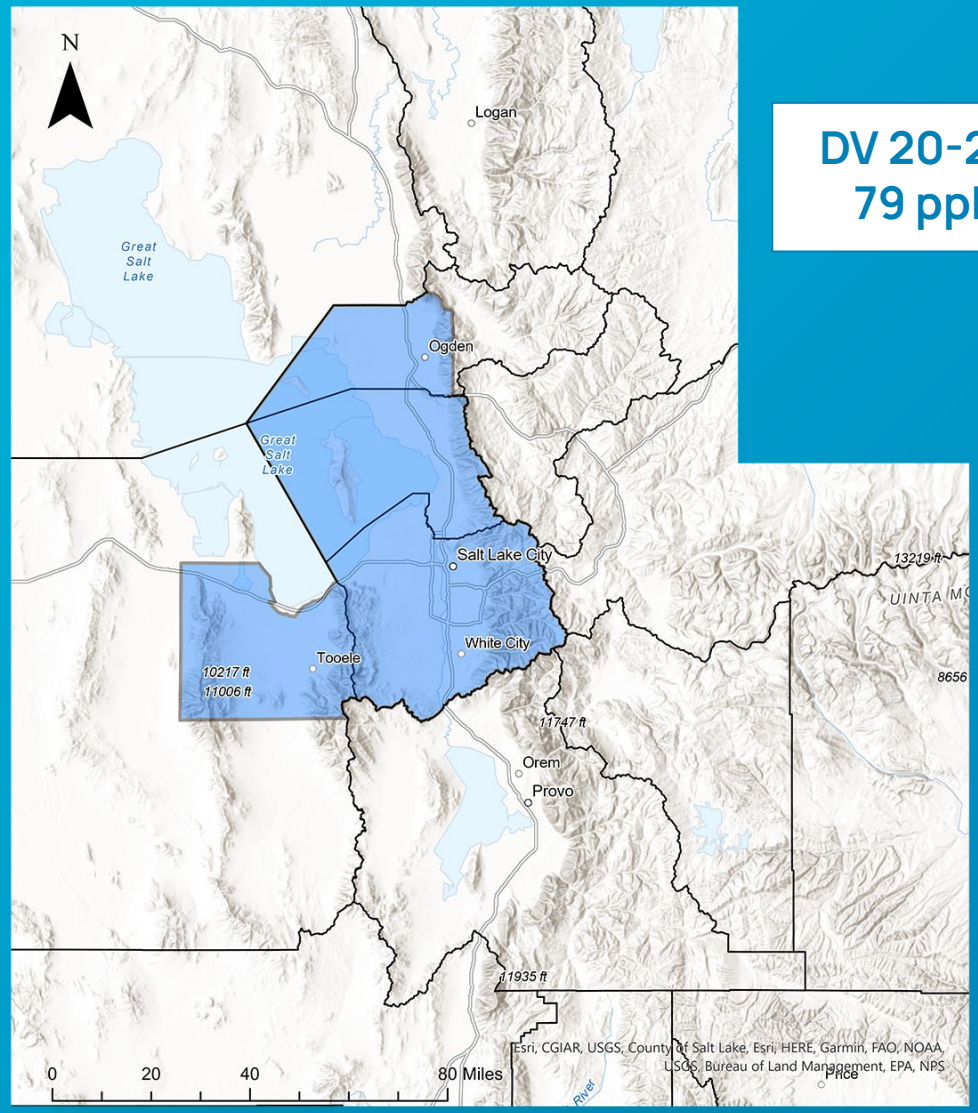
Ozone is a powerful oxidant that can irritate the airways.

Ozone can cause the muscles in the airways to constrict, trapping air in the alveoli. This leads to wheezing and shortness of breath.



With inflammation, the airway lining is damaged. It has been compared to the skin inflammation caused by sunburn.

Northern Wasatch Front Ozone Nonattainment Area



DV 20-22: 79 ppb

Pollution

Areas of the Wasatch Front are not meeting the 2015 NAAQS for ozone: 70 ppb.

Creating a Plan

The State will need to submit a State Implementation Plan (**SIP**) showing how the state plans to address pollution in this nonattainment area with an attainment demonstration.

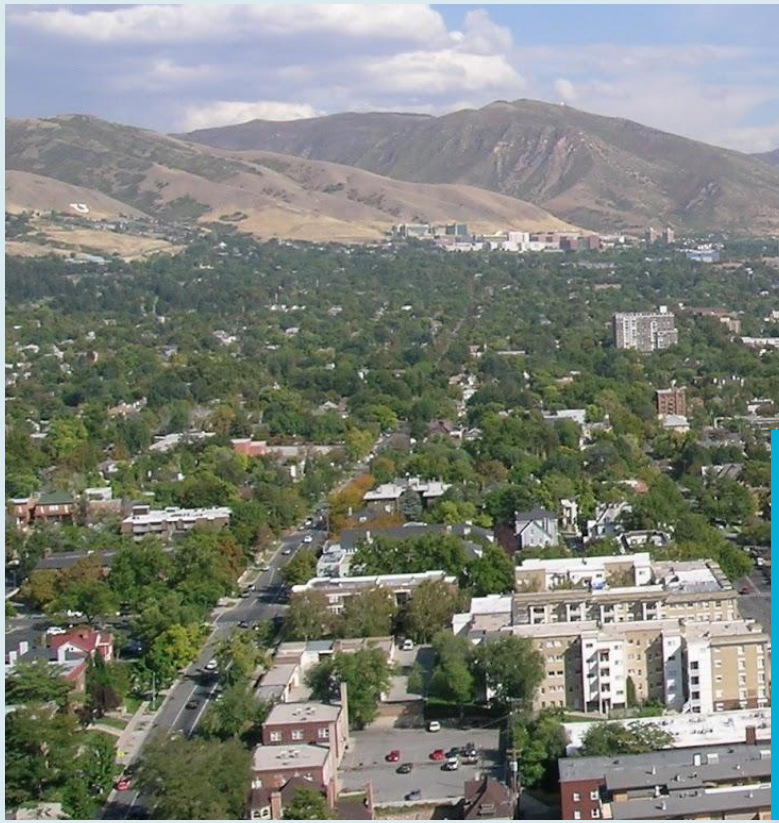
What is a State Implementation Plan (SIP)?

An all-inclusive document that outlines how the state plans to address ozone with rules & regulations that reduce emissions.

Required to reduce anthropogenic VOCs by 15% from 2017 to 2023. Reasonable Further Progress (RFP)

SIP Due January 2023
Attainment date August 2024

NWF Moderate Ozone SIP

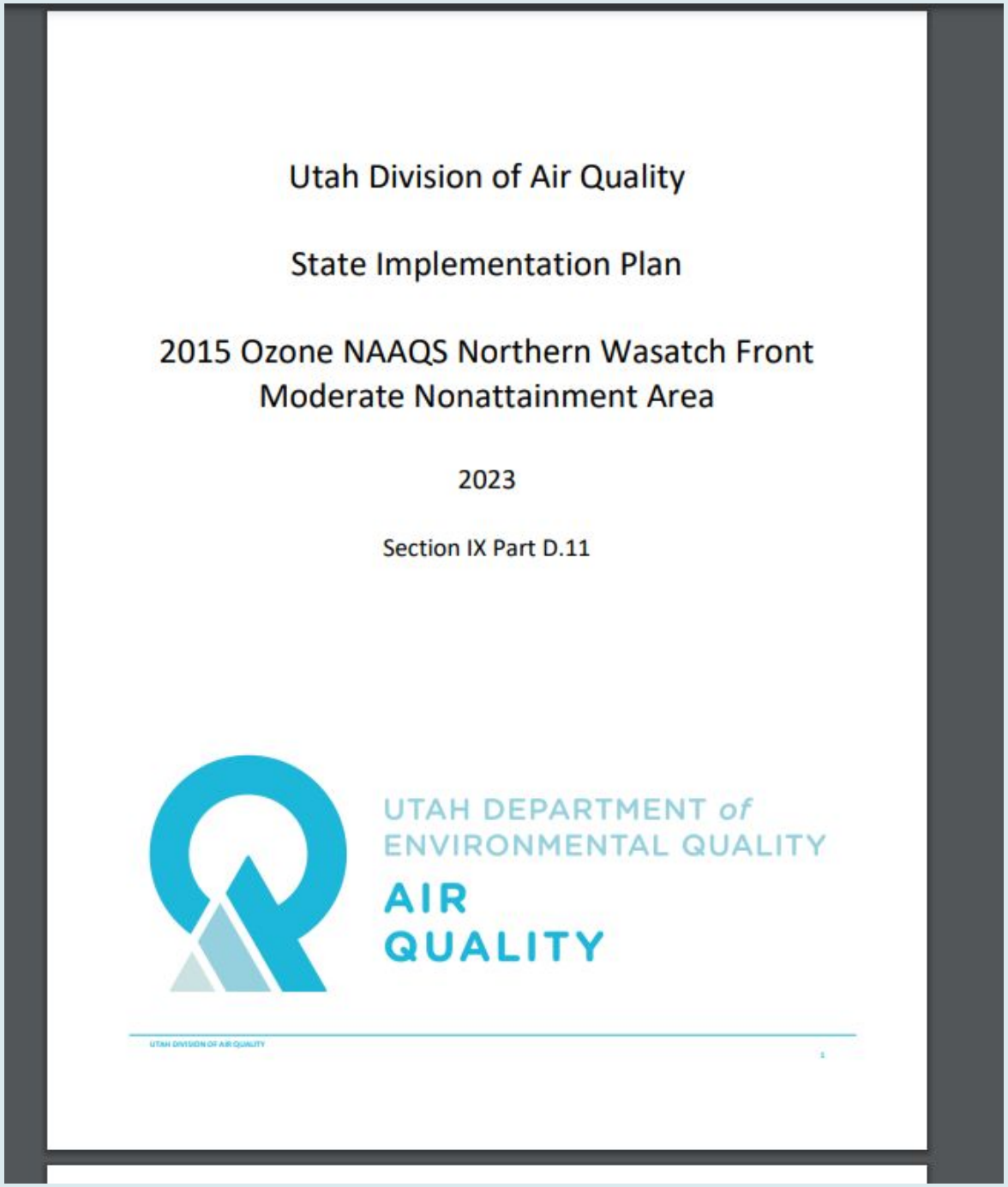


Public Comment
Air Quality Board:
April 5, 2023

Public Comment:
June 1 - July 17, 2023

Finalization
Air Quality Board:
September 6, 2023

Submit to EPA:
September, 2023



The proposed SIP can be viewed at:

https://deq.utah.gov/air-quality/northern-wasatch-front-moderate-ozone-sip-technical-support-documentation

CAA Requirements in this SIP

Category	Requirement	Reference	Addressed in Section
Reasonable Further Progress (RFP)	Demonstrate a 15% reduction of VOCs from the base year inventory to the attainment year.	CAA §182(b)(1)(A)(i) and 40 CFR §51.1310	Chapter 7 (IX D.11)
Base Year and Projected Emission Inventories	Establish the base year emission inventory (2017) and attainment year inventory (2023) for use in establishing RFP and demonstration of attainment.	CAA §182(b)(1)(B) and 40 CFR §51.1315	Chapter 3 (IX D.11)
Attainment Demonstration	Demonstration that the NAA will attain the standard using a photochemical model and methods approved in EPA modeling guidance.	CAA §182(c)(2)(A) and 40 CFR §51.1308	Chapter 8 (IX D.11)
Reasonable Available Control Technology (RACT)	Evaluation of the application of reasonable control technology (technically and economically feasible) at major sources.	CAA §182(b)(2) and 40 CFR §51.1312	Chapter 4 (IX D.11)
Reasonable Available Control Measure (RACM)	Evaluation of application of RACM for all other sources of ozone precursors.	CAA §182(b)(2) and 40 CFR §51.1312	Chapter 5 (IX D.11)
Motor Vehicle Inspection and Maintenance (I/M) Program	Evaluate if current I/M program meets CAA requirements.	CAA §182(b)(4)	Chapter 6 (IX D.11)
Nonattainment New Source Review (NNSR) Program	General offsets for VOCs increase to a ratio of 1.15 to 1.0.	CAA §182(b)(5) and 40 CFR §51.1314	Chapter 4 (IX D.11)
Contingency Measures	Emission reduction measure triggered if the NAA fails to attain the standard by the attainment date.	CAA §182(c)(9)	Chapter 11 (IX D.11)
Motor Vehicle Emission Budgets	Establishment of maximum allowable emissions from on-road mobile sector for ozone precursor emissions used in transportation conformity analysis.	CAA §182(c)(5)	Chapter 10 (IX D.11)

CAA Requirements in this SIP

Category	Requirement	Reference	Addressed in Section
Reasonable Further Progress (RFP)	Demonstrate a 15% reduction of VOCs from the base year inventory to the attainment year.	CAA §182(b)(1)(A)(i) and 40 CFR §51.1310	Chapter 7 (IX D.11)
Base Year and Projected Emission Inventories	Establish the base year emission inventory (2017) and attainment year inventory (2023) for use in establishing RFP and demonstration of attainment.	CAA §182(b)(1)(B) and 40 CFR §51.1315	Chapter 3 (IX D.11)
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Reasonable Available Control Technology (RACT)	Evaluation of the application of reasonable control technology (technically and economically feasible) at major sources.	CAA §182(b)(2) and 40 CFR §51.1312	Chapter 4 (IX D.11)
Reasonable Available Control Measure (RACM)	Evaluation of application of RACM for all other sources of ozone precursors.	CAA §182(b)(2) and 40 CFR §51.1312	Chapter 5 (IX D.11)
Motor Vehicle Inspection and Maintenance (I/M) Program	Evaluate if current I/M program meets CAA requirements.	CAA §182(b)(4)	Chapter 6 (IX D.11)
Nonattainment New Source Review (NNSR) Program	General offsets for VOCs increase to a ratio of 1.15 to 1.0.	CAA §182(b)(5) and 40 CFR §51.1314	Chapter 4 (IX D.11)
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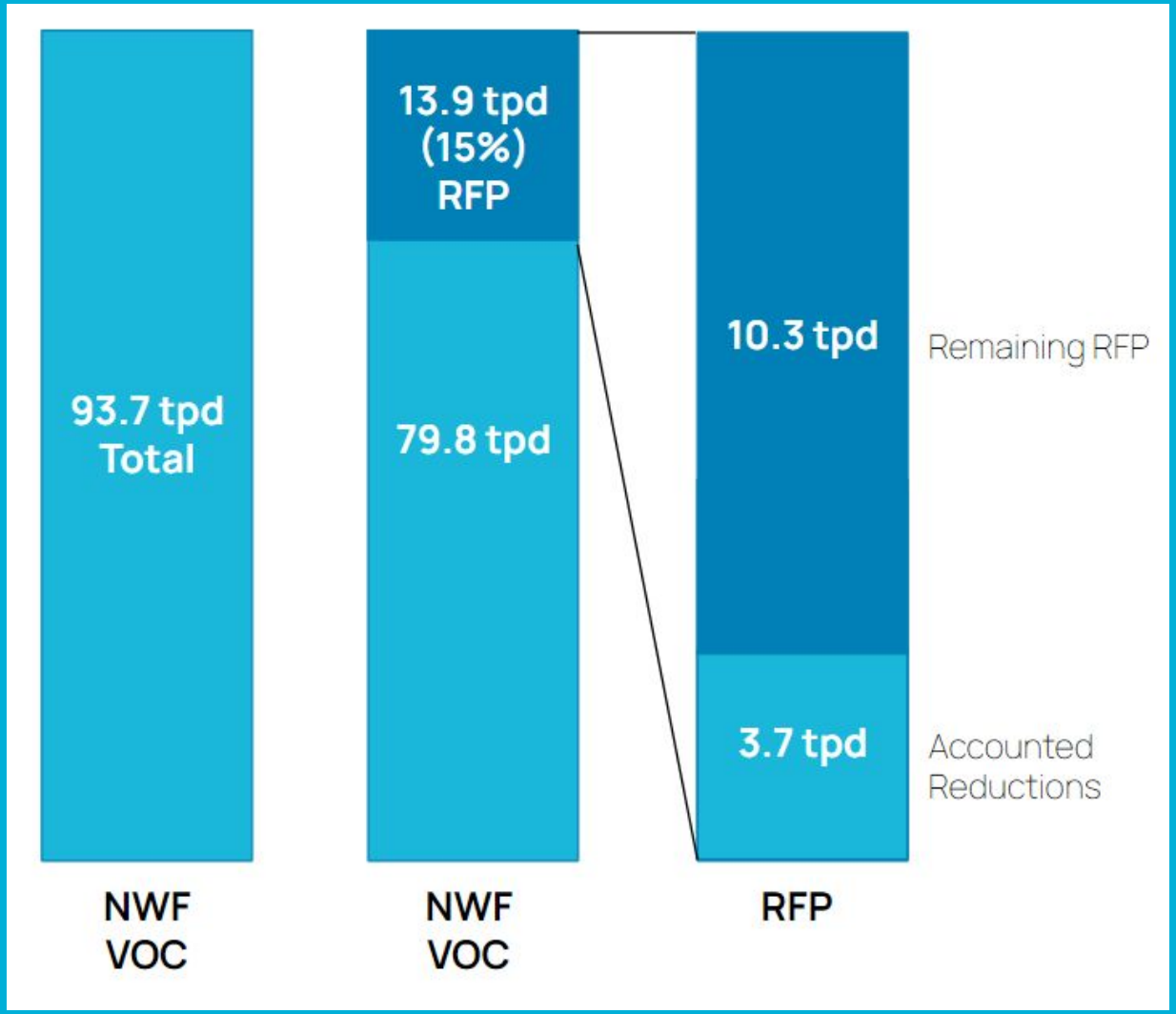
RFP 15%

“The state must identify and implement emission reduction strategies equal to or greater than 15% [VOCs] of the 2017 baseline inventory”

SIP accounts for a 3.9% reduction in VOC emissions, and thus does not fulfill CAA RFP requirements.

Northern Wasatch Front Anthropogenic VOC Emissions



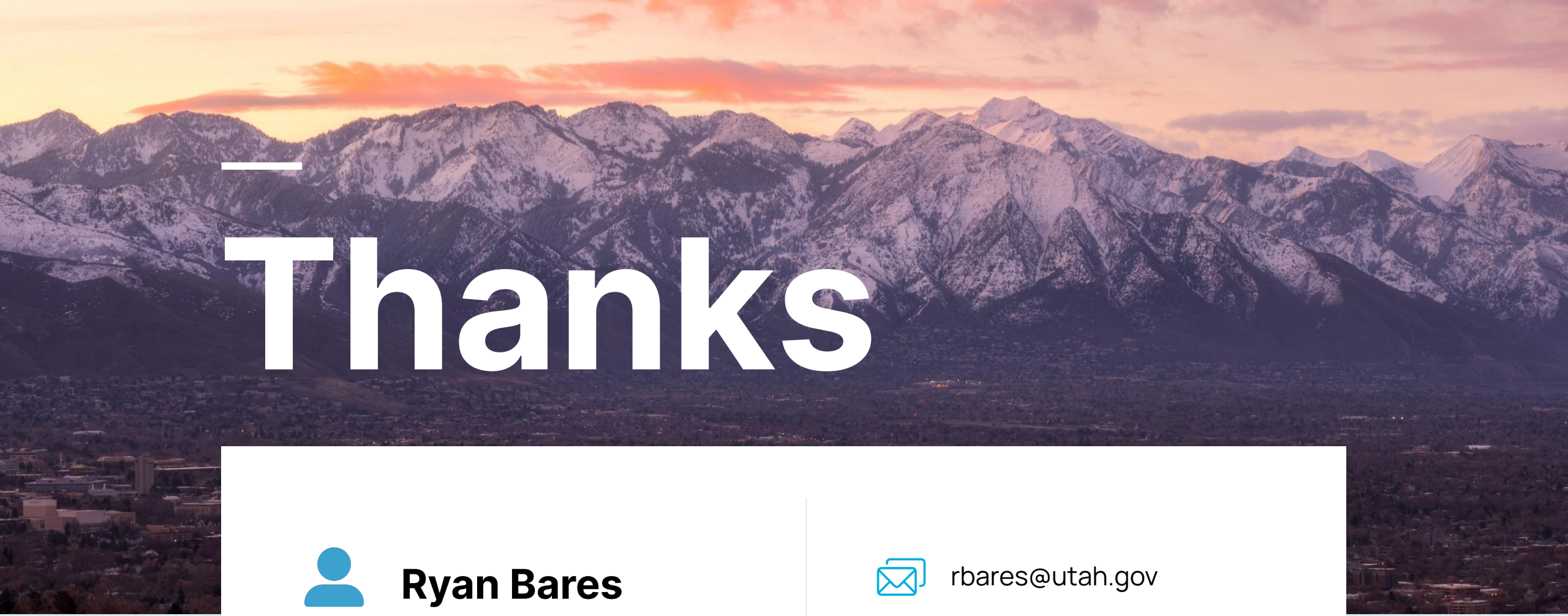
Motor Vehicle Emission Budgets (MVEB)

- MVEB: maximum allowable emissions originating from the on-road mobile sector for NO_x and VOCs

Table 75: NWF Ozone 2023 NAA MVEB

NWF, UT Ozone 2023 NAA MVEB			
Year	County	NO_x (tpd)	VOC** (tpd)
2023*	Davis (NA)	7.42	2.78
2023*	Salt Lake (NA)	20.98	8.53
2023*	Tooele (NA)	3.49	0.81
2023*	Weber (NA)	5.69	2.06
	Total	37.58	14.18
NA = NAA County Portion			
* Gasoline 10 PPM Sulfur			
**VOC = VOC does not include Refueling Displacement and Spillage			

- The proposed MVEB was developed in accordance with EPA criteria and would fulfill CAA requirements if approved. However, MVEBs are tied to RFP requirements, and thus this budget may not be approved. This could result in transportation lapses and freezes for the NWF in the near future.



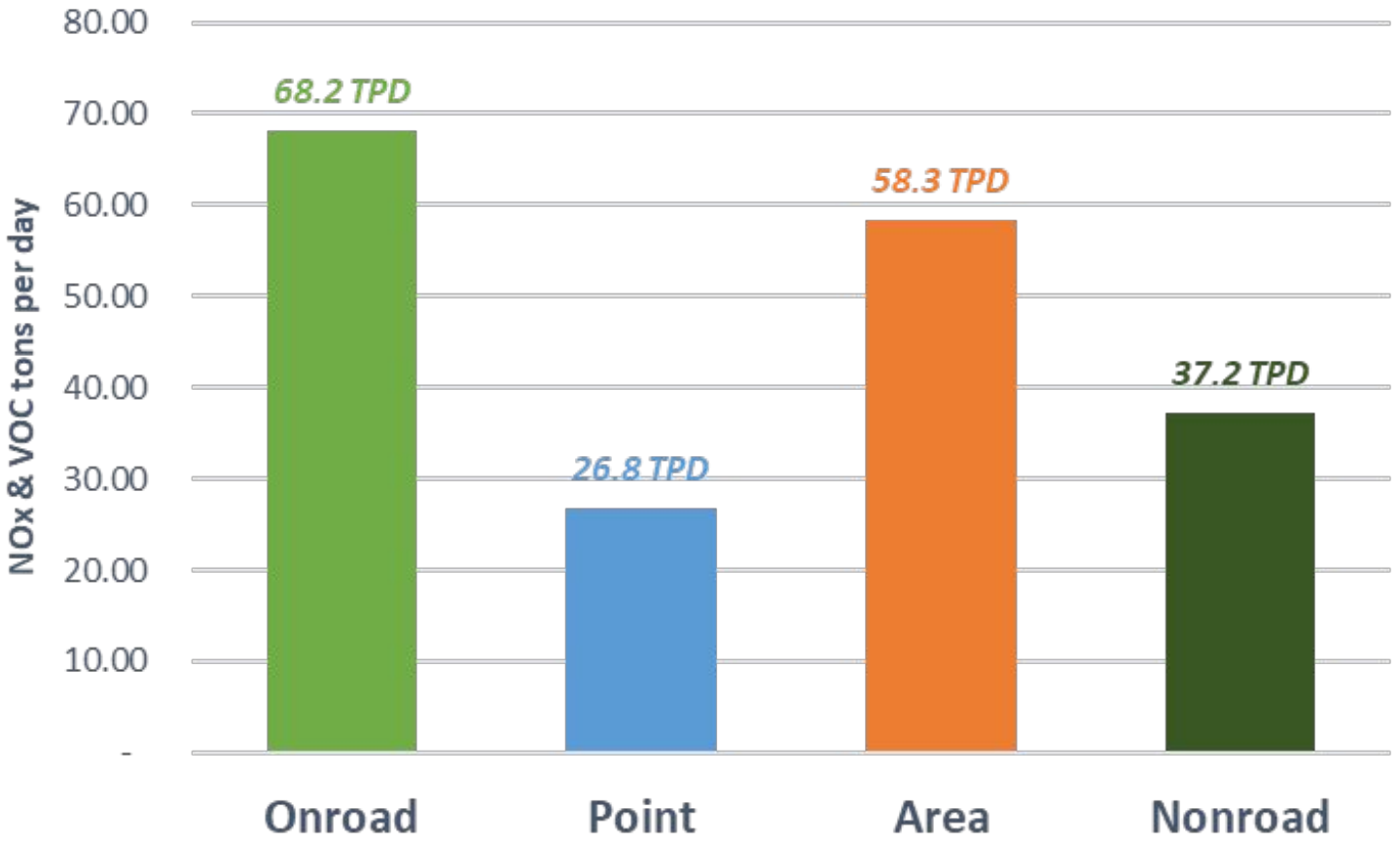
Thanks

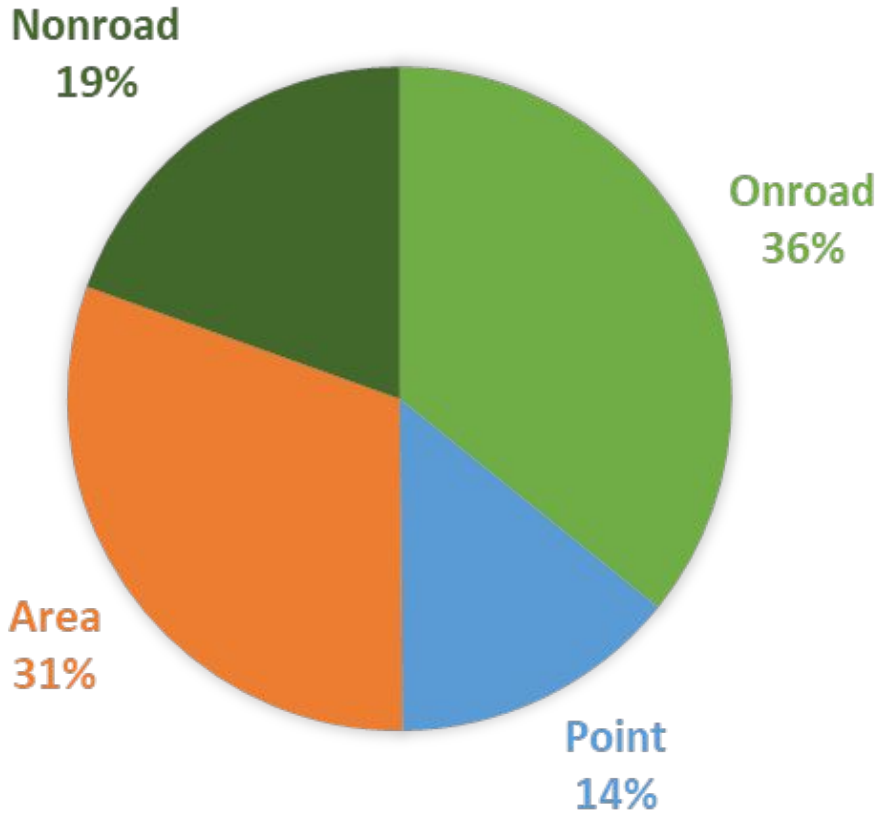
Ryan Bares

rbares@utah.gov

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
AIR QUALITY

Man-Made NOx and VOC Emissions in the Northern Wasatch Front on an average "ozone season" day





A substantial portion of the emissions that drive local ozone formation are very difficult to regulate at the state level

Reasonable Further Progress

“The state must identify and implement emission reduction strategies equal to or greater than 15% [VOCs] of the 2017 baseline inventory“

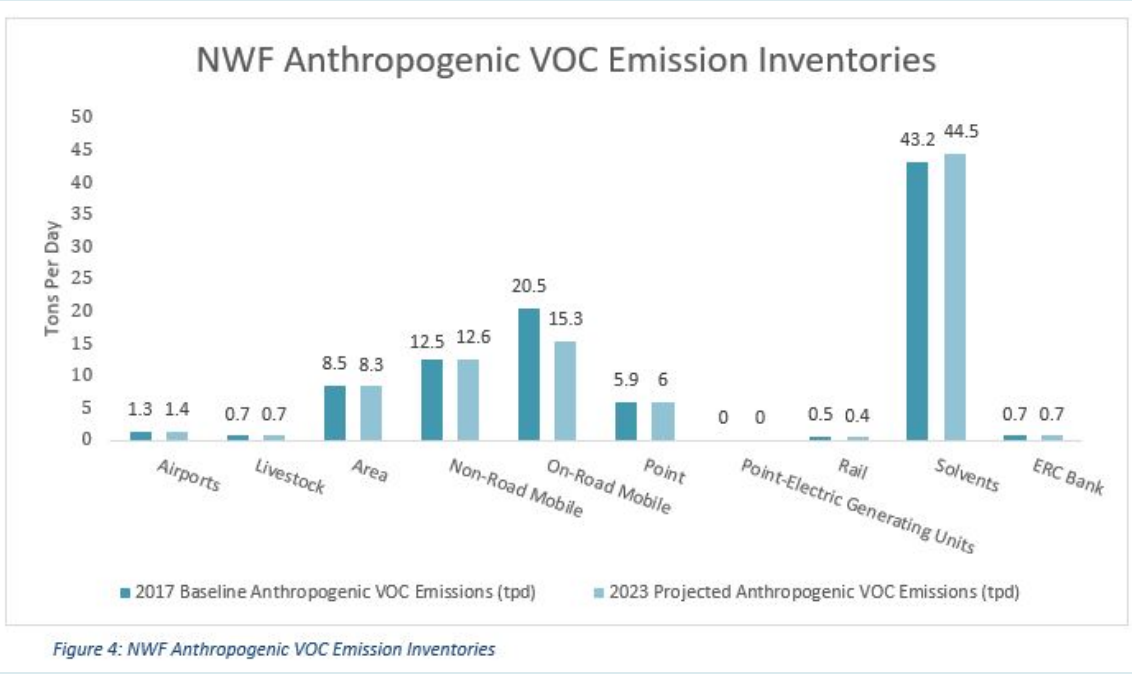


Figure 4: NWF Anthropogenic VOC Emission Inventories

Table 64: Anthropogenic VOC Emission Reductions from 2017 to 2023 for the NWF

Source Sector	2017 Baseline Anthropogenic VOC Emissions (tpd)	2023 Projected Anthropogenic VOC Emissions (tpd)	Δ Anthropogenic VOC Emissions (tpd)	% Δ Anthropogenic VOC Emissions
Airports	1.3	1.4	0.2	15.4
Livestock	0.7	0.7	----	----
Area	8.5	8.3	-0.2	-2.4
Non-Road Mobile	12.5	12.6	0.1	0.8
On-Road Mobile	20.5	15.3	-5.2	-25.4
Point	5.9	6	0.1	1.7
Point-Electric Generating Units	0	0	----	----
Rail	0.5	0.4	-0.1	-20
Solvents	43.2	44.5	1.3	3.0
ERC Bank	0.7	0.7	----	----
Total	93.7	90	-3.7	-3.9

- SIP demonstrates a 3.9% reduction in VOC emissions and thus does not fulfill CAA requirements
- The obligation to meet RFP requirements is ongoing and the state will continue work on fulfilling this requirement in the coming years
- Could impact access to federal highway funding in the near future.

NWF NAA Inventories

NWF 2017 vs 2023 Anthropogenic NOx Emissions

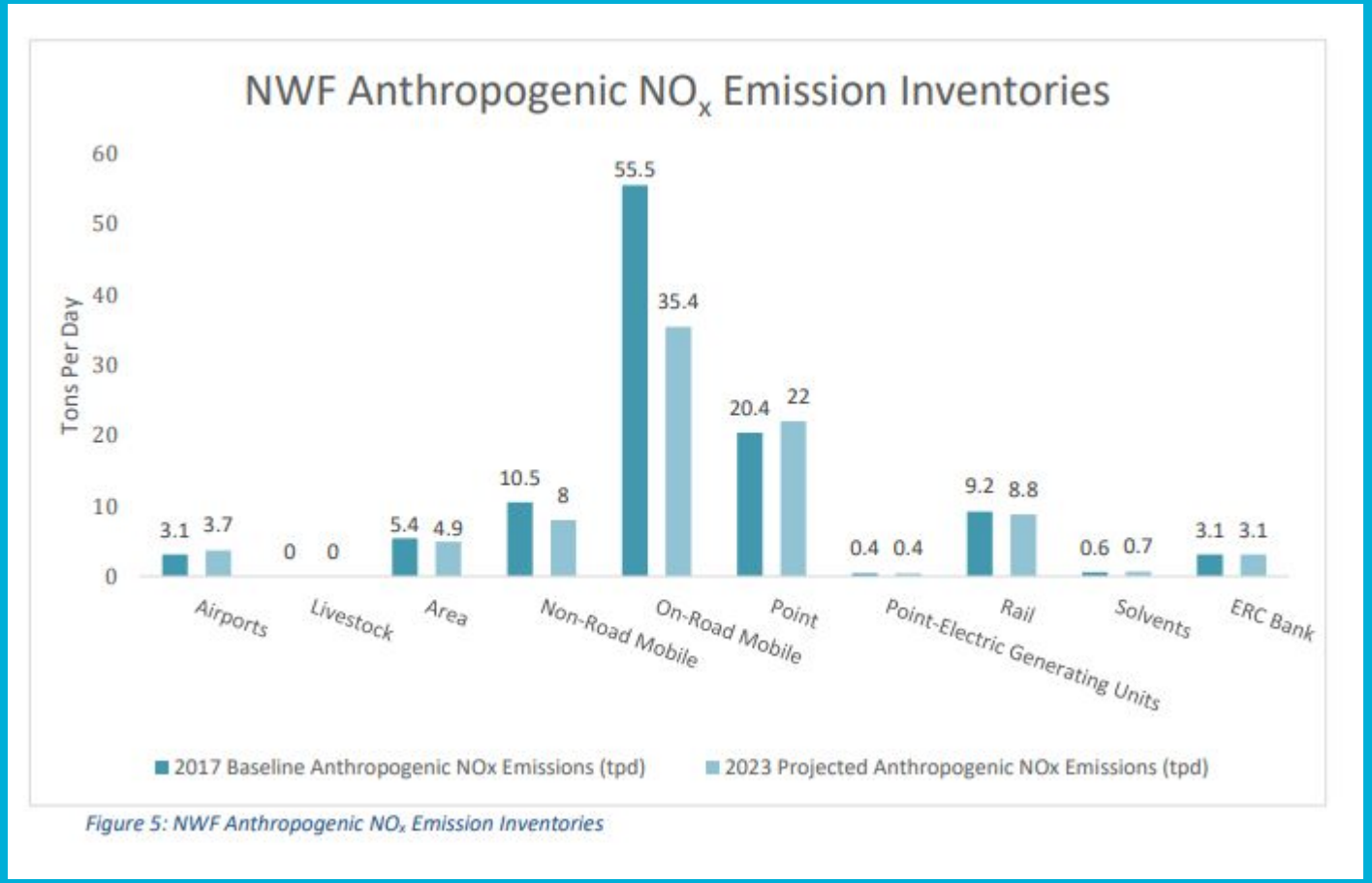


Figure 5: NWF Anthropogenic NO_x Emission Inventories

Conformity Implications of Ozone SIP Status

June 15, 2023

WASATCH FRONT REGIONAL COUNCIL

Attainment vs Conformity

- **Attainment**
  - Is the air pollution exceeding federal health standards?
  - Air quality monitors
  - Pollution concentration ($\mu g/m^3$ or ppb)
  - State prepares SIP
- **Conformity** (transportation)
  - Are mobile source emissions within SIP limits?
  - Modeling and analysis
  - Emission quantity (tons/day)
  - WFRC prepares conformity analysis

Likely Scenario

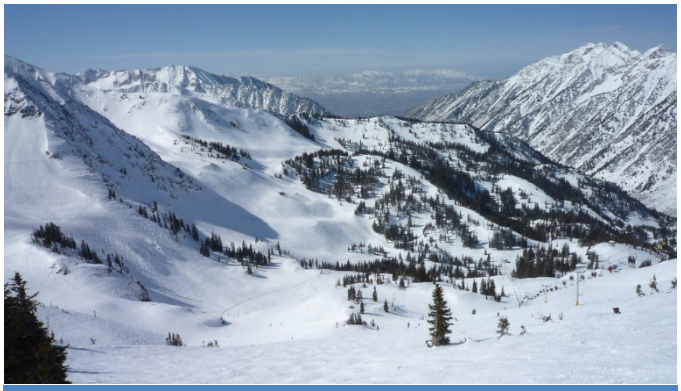
- EPA disapproves Moderate Ozone SIP in September, 2024
- By federal regulation, a disapproval triggers a conformity freeze
  - Only certain transportation projects can proceed
    - Projects already in the first four years of the RTP and TIP
    - Projects exempt from conformity requirements

Potential Further Implications

- After 2-year conformity freeze, transportation sanctions are put in place
  - The only way this can be avoided is for EPA to approve a Serious Ozone SIP
  - Only exempt projects would be allowed to proceed

Transportation Planning Recommendation

- Amend RTP and TIP prior to conformity freeze



Travel Demand Management Strategies for the Cottonwood Canyons

Little Cottonwood Canyon Environmental Impact Statement

October 2, 2020

Contents

Tables

Figures

Appendices

Acronyms and Abbreviations

AADT	average annual daily traffic
ATR	automated traffic recorder
EIS	Environmental Impact Statement
EOI	expression of interest
FHWA	Federal Highway Administration
I-15	Interstate 15
mph	miles per hour
MPO	metropolitan planning organization
RP	revealed preference
SOV	single-occupant vehicle
SP	stated preference
TDM	travel demand management
UDOT	Utah Department of Transportation
UTA	Utah Transit Authority
VOTTS	value of travel time savings
WTP	willingness to pay

1 Executive Summary

In support of Utah Department of Transportation's (UDOT) Little Cottonwood Canyon Environmental Impact Statement (EIS) on State Route (S.R.) 210 and the Big Cottonwood Canyon Corridor Plan on S.R. 190, this report was produced to identify travel demand management (TDM) strategies to improve mobility on both roads. The TDM strategies in this report use a "carrot and stick," or incentive and disincentive, approach to achieving a shift in travel modes to reduce traffic congestion. Any TDM strategy would require an improved, robust transit system in order to be successful, and vice versa. To incentivize use of a new transit system, a disincentivizing TDM solution would also need to be in place. To develop TDM strategies, a public survey was conducted to help UDOT further understand canyon users' decision-making when it comes to transit and fees. Over 1,000 Utah residents were surveyed, and the results show that users are willing to pay a fee for more-reliable travel times or a new, improved transit service.

The TDM strategies investigated in this report include tolls or congestion pricing, occupancy restriction, and parking management. A congestion pricing model that includes a year-round flat fee of $3 to $5 per vehicle coupled with an increased winter peak-period fee of $20 to $30 per vehicle yields the highest potential for collecting fees and improving mobility. A conceptual analysis shows that this strategy has the potential to reduce the number of personal vehicles in the canyons and generate a fee collection over $5 million annually depending on the implementation. These results are exploratory in nature, and further tolling and revenue analysis is needed if UDOT desires a bond or other financial instrument. This report does not include investment-grade analysis regarding tolling.

Note that the potential for implementing user fees in the canyons is changing because parking fees are being considered at the ski resorts. If this happens, UDOT would need to consider the viability of tolls or congestion pricing. In this case, a TDM strategy such as a ban on single-occupant vehicles could be more aligned with mobility improvement goals. The analysis team's research suggests that, regardless of the strategy UDOT chooses, a federal decision is required.

Enforcement methods for implementing either strategy vary depending on the compliance UDOT desires. Tolling technologies such as occupancy-detection devices are emerging and maturing, but there are cost and reliability concerns. UDOT is currently piloting an app-based occupancy-verification method. A new enforcement system for tolling in the Cottonwood Canyons is recommended to be an extension of the existing tolling program enforcement. A "one-off" (separate) system would pose significant management challenges and prohibitive high costs.

Travel patterns in both canyons are similar, with traffic increasing along with seasonal recreation opportunities (specifically, winter skiing). The traffic analysis in this report shows that winter weekends and holidays are the peak periods when mobility declines due to the increased volume of traffic and heightened directionality (that is, motorists heading east to the ski resorts during the mornings and west during the late afternoons). HDR's analysis of occupancy data also shows that about one-third of vehicles have only

one passenger during these times. The directionality of traffic and low vehicle occupancy are characteristics that can be addressed with TDM measures to improve mobility.

2 Introduction

Travel demand management broadly refers to a set of strategies implemented by transportation agencies to ease traffic congestion by reducing demand on roadway networks. Specific to Big and Little Cottonwood Canyons (the Cottonwood Canyons), UDOT is studying TDM strategies in conjunction with the Little Cottonwood Canyon EIS with the goal of influencing travel behavior during peak periods.

What is travel demand management?

TDM broadly refers to a set of strategies implemented by transportation agencies to ease traffic congestion by reducing demand on roadway networks.

Although the EIS study area is specific to S.R. 210 from Wasatch Boulevard to Alta, this report identifies strategies and resulting conceptual performance that could be implemented in both Big and Little Cottonwood Canyons. Given that the canyons are close to each other and experience similar traffic challenges, any TDM strategy should cover both canyons in order to maintain equity across the region and user groups.

During peak periods, travel times for entering and exiting the canyons increase, and mobility to and from the canyons and the surrounding areas of the Salt Lake Valley decreases. This report identifies TDM strategies that could be implemented to help improve mobility in the Cottonwood Canyons. UDOT could implement one of these strategies or a combination to obtain the best improvements to mobility.

What is mobility?

Mobility is the ability to move people or goods in an automobile or transit.

It is difficult to predict the exact outcome of a strategy to encourage vehicle users to change their behavior and shift to transit. At UDOT's request, HDR, Inc., conducted a public survey to better understand the choices of canyon users. HDR used the results of this survey, in conjunction with traffic analyses, to inform our development of TDM strategies and evaluate their performance.

This report draws preliminary conclusions about mode shift and user response to transit or fee-based TDM strategies. The analysis in this report is intended to be conceptual and exploratory in nature, and as such it cannot be used to secure bonds or other financial instruments. Investment-grade analysis for estimating fees paid or revenue was not completed, nor is it the intent of this report. Therefore, if one or a combination of these strategies are implemented, UDOT would closely monitor the strategy or strategies and make necessary adjustments to improve mobility.

Who is the analysis team?

The analysis team for this report is HDR and Fehr & Peers.

The traffic analyses for this report were conducted by HDR and Fehr & Peers (referred to as the analysis team).

3 Canyon Travel Profile

Developing TDM strategies relies on a strong understanding of existing traffic conditions in the canyons. This section covers pertinent traffic data and identifies a baseline travel profile for use in the TDM analysis.

3.1 Average Annual Daily Traffic Volumes

The analysis team obtained average annual daily traffic (AADT) volume estimates from UDOT for Little and Big Cottonwood Canyons between 2010 and 2016. Table 1 and Table 2 list the historical AADT in each canyon.

Table 1. AADT in Little Cottonwood Canyon (2010–2016)

Segment	2016	2015	2014	2013	2012	2011	2010
Fort Union to Bengal Blvd.	18,000	17,000	17,000	16,000	15,000	15,000	16,000
Bengal Blvd. to North Little Cottonwood Rd.	14,000	14,000	15,000	14,000	14,000	19,000	20,000
North Little Cottonwood Rd. to S.R. 209[a]	6,600	6,500	6,000	5,600	5,300	5,400	5,600
S.R. 209 to Albion Basin	6,600	6,500	6,000	5,600	5,300	5,400	5,600
Bypass Rd.	1,900	1,900	200	190	180	180	190

[a] AADTs for North Little Cottonwood Rd. to S.R. 209 are not directly measured and are assumed to be comparable to the S.R. 209 to Albion Basin segment.

Table 2. AADT in Big Cottonwood Canyon (2010–2016)

Segment	2016	2015	2014	2013	2012	2011	2010
Wasatch Blvd. to Fort Union Blvd.	22,000	21,000	20,000	19,000	19,000	19,000	19,000
Fort Union Blvd. to Storm Mountain	5,600	5,200	4,500	4,200	4,000	3,800	4,100
Storm Mountain to Spruces Campground	3,700	3,400	2,900	2,700	2,600	2,500	2,700
Spruces Campground to Guardsman	3,300	3,000	2,900	2,700	2,600	2,500	2,700
Guardsman to Brighton Loop	1,900	1,700	1,500	1,400	2,200	2,100	2,300

3.2 ATR Data and Canyon Demand

UDOT maintains an automated traffic recorder (ATR) at the base each canyon, and these ATRs provide hourly traffic count data throughout the year. The analysis team analyzed the data from ATR 0317 for Little Cottonwood Canyon and ATR 0322 for Big Cottonwood Canyon from 2017 in order to analyze peak days and hours. Figure 1 and Figure 2 show the ATR data from each canyon for every day in 2017.

Figure 1. Daily Traffic Volume on S.R. 210 (Little Cottonwood Canyon) (2017 ATR Data, Two-Way)

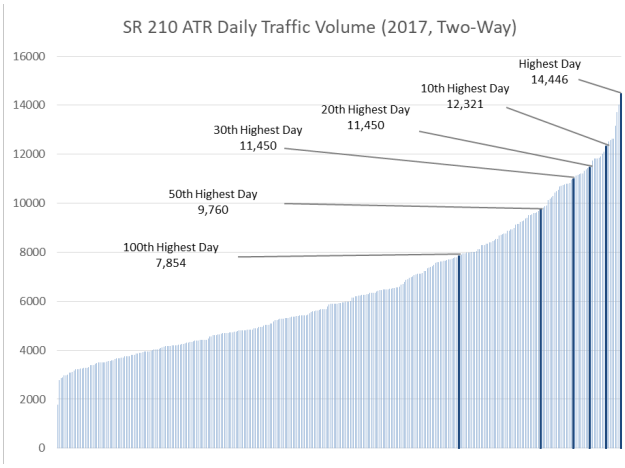
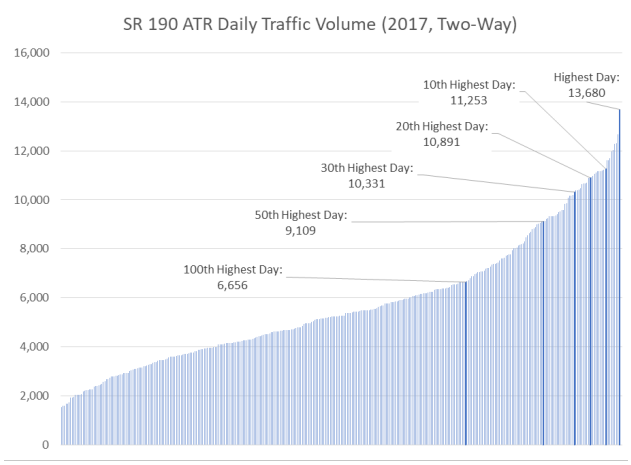


Figure 2. Daily Traffic Volume on S.R. 190 (Big Cottonwood Canyon) (2017 ATR Data, Two-Way)



Evaluating ATR data is informative because of the granularity it provides for traffic analysis in the canyons. Although AADT gives a general sense of traffic volumes on a road, ATR data are more precise and are more suited for analyzing the unique traffic profile in the canyons. The seasonality and directionality of traffic during peak periods are critical elements to TDM strategies and mobility concerns, and the granularity of ATR data is needed for this analysis.

ATR data are also helpful because of the geography and traffic operations in the canyons. S.R. 210 in Little Cottonwood Canyon is a dead-end route with no through traffic, and in winter S.R. 190 in Big Cottonwood Canyon functions as a dead-end route when the connection to Park City over Guardsman's Pass is closed. With this constraint, ATR data provide clarity into the traffic demand in each canyon so that UDOT can develop TDM strategies and evaluate their performance. Given that the peak-period traffic in both corridors is highly directional, most of the analysis in Section 2.2 focuses on inbound (eastbound) traffic counts. Because the canyons are closed systems, if the inbound traffic total demand can be mitigated, the resulting outbound (westbound) mobility should in turn improve on peak days.

Table 3 and Table 4 show the top-ranked inbound hours for each canyon in 2017. These hours are ranked in terms of their directional volume.

Table 3. Peak Inbound Traffic Counts (Top-ranked Hours) on S.R. 210 in Little Cottonwood Canyon in 2017

Rank	Directional Volume	Date	Time of Day	Day of Week	Season
Highest	1,375	2/12/2017	08:00	Sunday	Winter
10th	1,209	1/2/2017	09:00	Monday	Winter
20th	1,132	1/22/2017	09:00	Sunday	Winter
30th	1,061	1/14/2017	10:00	Saturday	Winter
50th	910	12/24/2017	08:00	Sunday	Winter
100th	764	9/17/2017	12:00	Sunday	Fall
85th %	250	3/19/2017	08:00	Sunday	Spring

Table 4. Peak Inbound Traffic Counts (Top-ranked Hours) on S.R. 190 in Big Cottonwood Canyon in 2017

Rank	Two-way Volume	Date	Time of Day	Day of Week	Season
Highest	1,219	1/29/2017	08:00	Sunday	Winter
10th	1,106	1/2/2017	09:00	Monday	Winter
20th	959	3/11/2017	08:00	Saturday	Winter
30th	840	12/26/2017	08:00	Tuesday	Winter
50th	753	1/3/2017	08:00	Tuesday	Winter
100th	570	3/26/2017	09:00	Sunday	Winter
85th %	225	1/13/2017	13:00	Friday	Winter

3.3 Peak-period Travel

The Cottonwood Canyons are used year-round because they provide many recreation and scenic opportunities. The TDM strategies in this report were identified for their effectiveness during peak periods of congestion, which occur when traffic increases, thereby reducing mobility.

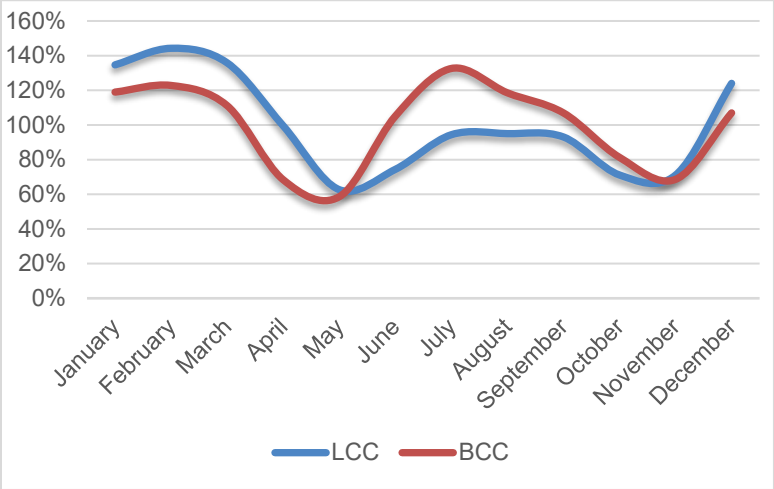
What are peak periods?

Peak periods are similar to "rush hour" workday commutes when traffic congestion occurs and travel times increase.

These peak periods of congestion occur in the Cottonwood Canyons during the winter months on weekends and holidays during the morning and evening when the ski resorts are opening and closing. Although TDM strategies might influence driver behavior year-round, the intent of this report is to address strategies for improving mobility during the winter peak periods of congestion.

Figure 3 shows a 10-year average of monthly distribution of travel in the canyons. Compared to average travel (the 100% line), canyon travel increases in the summer and winter months. On average, Big and Little Cottonwood Canyons experience 20% to 40% more traffic during the winter months than they do during the "shoulder" or "off-season" months of spring and late fall.

Figure 3. Average Monthly Distribution of Traffic in Cottonwood Canyons (2008–2017)



The analysis team summarized ATR data for 2015 through 2017 to develop a baseline profile for travel demand in the canyons. This baseline is needed to evaluate the performance of TDM strategies and to help assign inbound values to future-year forecasts.

Table 5 presents a baseline profile of inbound seasonal traffic for each canyon. Based on ATR data, this table shows the percentage of total inbound trips for each canyon distributed by season, day type, and subsequent time of day. The seasons are defined as fall (September to December), winter (December to mid-April), spring (mid-April to June), and summer (June to September). Table 5 shows that the winter months

experience the highest percentage of inbound canyon traffic. Appendix A includes an expanded traffic distribution table.

Table 5. Seasonal Distribution of Inbound Traffic in Cottonwood Canyons (Baseline Profile)

Season or Day	Big Cottonwood Canyon	Little Cottonwood Canyon
Fall	21%	20%
Spring	7%	8%
Summer	32%	25%
Winter	40%	47%
Weekend/holiday	43%	41%
Weekday	57%	59%

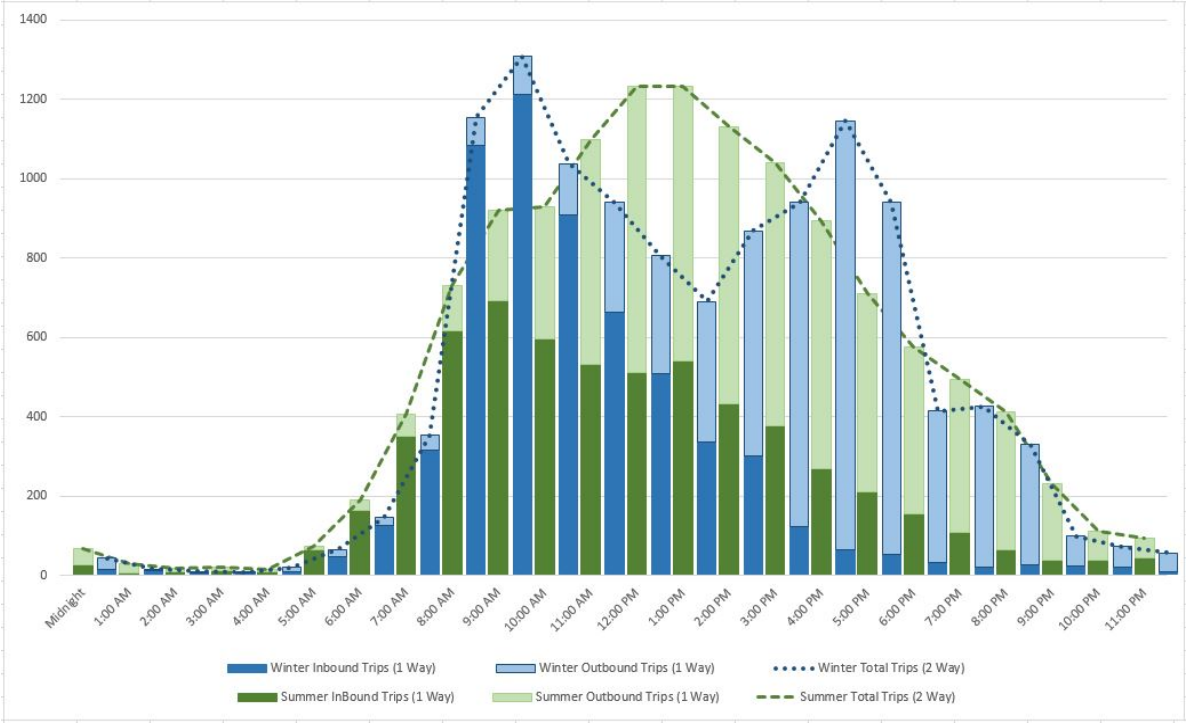
Fall = September to December, winter = December to mid-April, spring = mid-April to June, summer = June to September

Although the summer and early fall months have more traffic compared to spring, this increase in traffic does not contribute to congestion because the traffic is balanced directionality and because these trips are more evenly distributed throughout the day.

The analysis team's analysis of ATR data shows that canyon travel is highly directional during the winter months. This directionality associated with narrow peak hours is what contributes to canyon congestion and mobility concerns. Figure 4 shows two example 24-hour travel profiles: one from a peak winter day on S.R. 210 in Little Cottonwood Canyon and one from a peak summer day on S.R. 190 in Big Cottonwood Canyon. Winter inbound and outbound trips are shown in the blue stacked bar and dashed line; summer trips are shown in green.

During the winter, the hourly demand peaks in the morning and evening hours, and conversely hourly demand peaks midday during the summer. Winter peak demand is associated with the opening and closing of ski resorts and the operating hours at the resorts. Summer activities are generally more dispersed throughout the canyons and so are tightly associated with businesses' operating hours. Winter trips are highly directional, with users heading "up canyon" or inbound in the morning to go skiing or snowboarding and "down canyon" or outbound in the late afternoon.

Figure 4. Seasonal Traffic Profiles for Cottonwood Canyons (2017)



Little Cottonwood Canyon data from January 2, 2017. Big Cottonwood Canyon data from July 4, 2017.

To further examine this directional disparity, the analysis team analyzed ATR data from 15 winter and 15 summer days when two-way traffic exceeded 10,000 vehicles. Sample days were selected on S.R. 210 in Little Cottonwood Canyon during the winter months of January and February 2017 and on S.R. 190 in Big Cottonwood Canyon during the summer months of June, July and August 2017.

Table 6 lists the hours that represented the highest percentage of daily traffic for this sample period. The winter peak hours have 84% to 94% of traffic heading in one direction, which correlates with the travel profile in Figure 4 above. Summer hours have a much more even distribution, with no more than 55% of traffic heading in one direction. With this even distribution in summer peak-hour traffic, the roadway capacity is never reached and does not contribute to congestion in the same way that winter traffic does. During the sample period, summer traffic volumes in either direction never exceeded 900 vehicles per hour. In winter, 59 directional hours exceeded 900 vehicles per hour, with the highest hourly volume recorded as 1,327 vehicles during an 8 AM inbound hour.

Table 6. Traffic Directionality for Sample Period

Season and Canyon	Peak Hour	Inbound Percentage (Volume)	Outbound Percentage (Volume)
Winter in Little Cottonwood Canyon	8 AM	94%	6%
	9 AM	90%	10%
	3 PM	16%	84%
	4 PM	11%	89%
Summer in Big Cottonwood Canyon	1 PM	48%	52%
	2 PM	48%	52%
	3 PM	47%	53%
	4 PM	45%	55%

3.4 Future-year Traffic Forecasts

Forecasting traffic demand into the future is necessary for any transportation planning exercise. For this report, the analysis team developed Little Cottonwood Canyon and Big Cottonwood Canyon traffic forecasts for the horizon years 2030, 2040, and 2050. The analysis team used a combination of the Utah Statewide Travel Demand Model and "off-model" sketch planning analysis leveraging historical ATR trends to develop inbound travel volumes for the horizon years.

Given historical trends, the projected future-year traffic volumes for 2050 suggest that, with no action taken to improve mobility in the canyons, both canyons will have a travel demand of more than 8,000 inbound vehicles on a peak day in 2050 and more than 6,000 inbound vehicles on the 50th-highest traffic day of 2050. In other words, the levels of traffic today associated with the five busiest days of the year in 2017 would become commonplace in 2050 throughout much of the peak winter season and busy days during the summer and fall (Fehr & Peers 2019). Although the canyons have a limited number of parking spaces, users are becoming ever more tolerant of roadside parking adjacent to ski resorts and other canyon destinations.

Figure 5, Table 7, Figure 6, and Table 8 summarize the traffic forecasts that were developed for 2030, 2040, and 2050.

Figure 5. Actual (2015–2017) and Projected (2050) Vehicles Entering Big Cottonwood Canyon during the 50 Highest-traffic Days

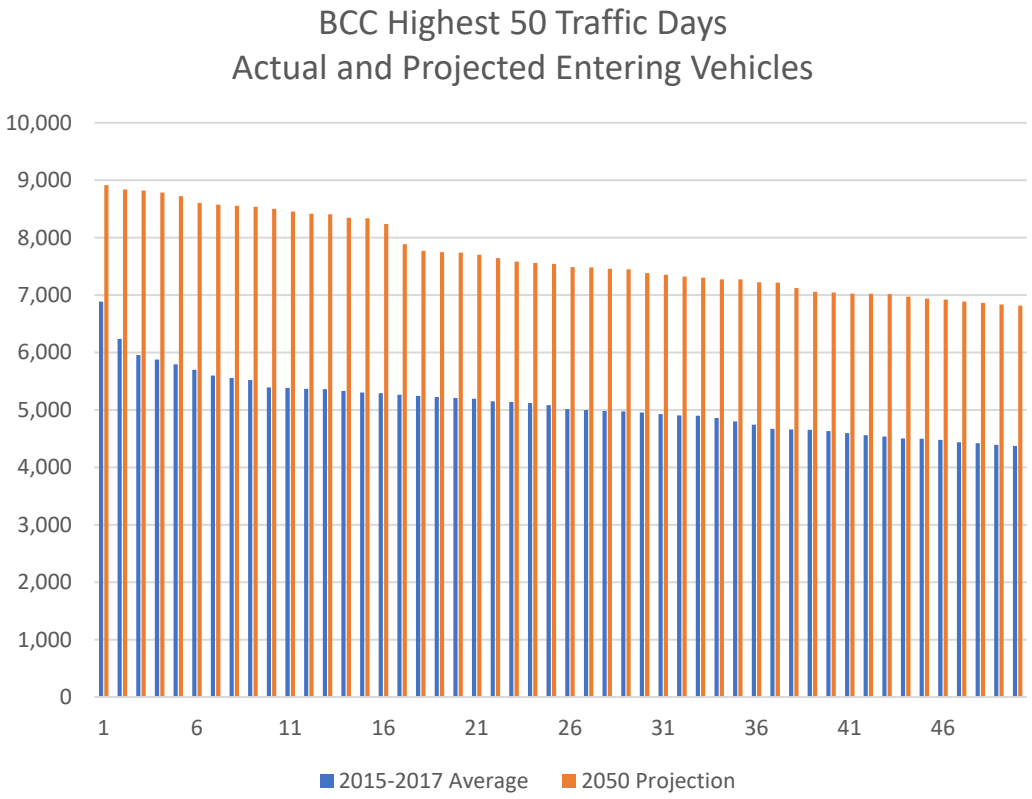


Table 7. Inbound Trip Thresholds in Big Cottonwood Canyon by Year (2015–2017, 2030, 2040, and 2050)

Trips	Actual	Projected		
	2015–2017 Average	2030	2040	2050
5,000	26	≥50	≥50	≥50
6,000	2	23	≥50	≥50
7,000	0	1	17	43
8,000	0	0	0	16

Figure 6. Actual (2015–2017) and Projected (2050) Vehicles Entering Little Cottonwood Canyon during the 50 Highest-traffic Days

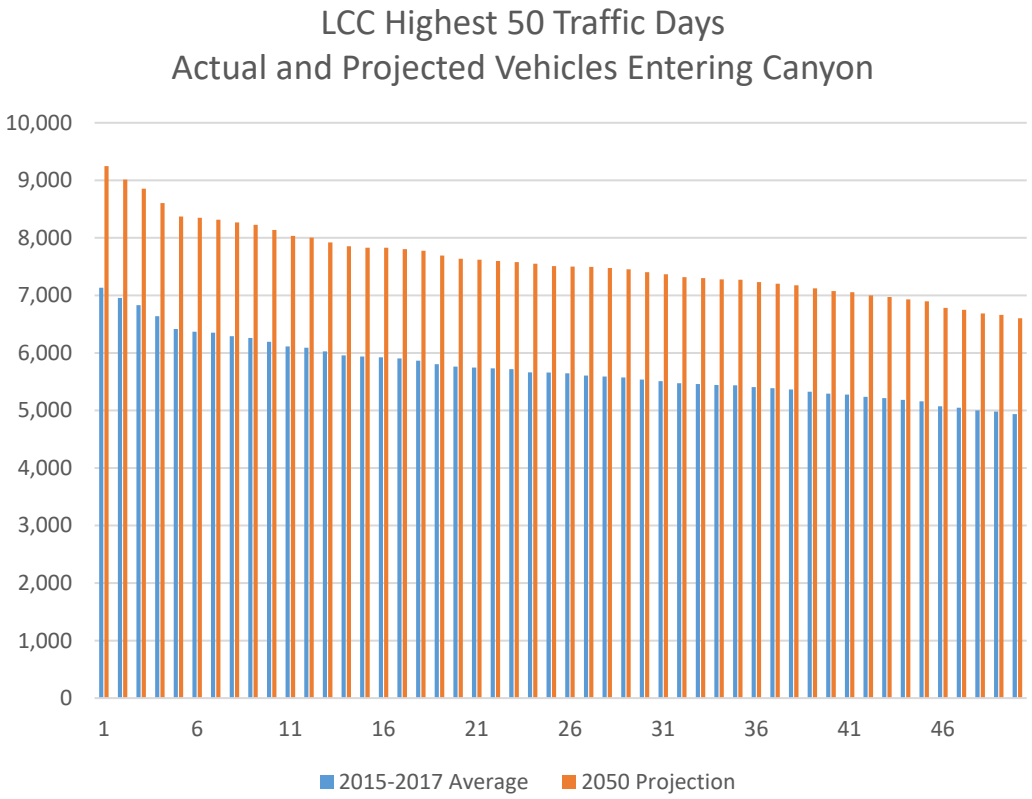


Table 8. Inbound Trip Thresholds in Little Cottonwood Canyon by Year (2015–2017, 2030, 2040, and 2050)

Trips	Actual	Projected		
	2015–2017 Average	2030	2040	2050
5,000	48	≥50	≥50	≥50
6,000	13	41	≥50	≥50
7,000	1	9	23	42
8,000	0	0	3	12
9,000	0	0	0	2

Table 9 presents a forecasted travel profile by inbound volumes that is derived from the traffic forecasts presented above in conjunction with the baseline travel profile from Table 5. For this forecast, the analysis team assumes that travel patterns, canyon demand, and uses will be similar in the future to what they are today. We are confident in this assumption given that land use policies in the canyon are not changing. Although the traffic volume during some shoulder seasons and off-peak days will likely increase, we do not have any reason to believe that the seasonal distribution of traffic will drastically change. Our forecasts have accounted for increases in traffic across all seasons and

growth rates for those were developed contextual to each season. Appendix A includes an expanded forecast table.

Table 9. Travel Profile Forecast of Inbound Trips

Season or Day	Forecasted Resulting Inbound Trips					
	Big Cottonwood Canyon			Little Cottonwood Canyon		
	2030	2040	2050	2030	2040	2050
Fall	253,409	293,364	339,807	261,412	282,792	305,922
Spring	83,159	96,271	111,512	108,243	117,096	126,673
Summer	383,871	444,396	514,749	324,293	350,816	379,509
Winter	483,080	559,247	647,782	623,921	674,951	730,154
Weekend/holiday	518,118	599,809	694,766	538,398	582,433	630,069
Weekday	685,401	793,468	919,083	779,471	843,223	912,188

3.5 Vehicle Occupancy

Vehicle occupancy is defined as the number of people occupying a vehicle during a trip. The analysis team collected field data for vehicle occupancy during the winter of 2018 and also used occupancy data collected during the Mountain Accord Study in 2017 and 2016. Vehicle occupancy rates vary among weekends, weekdays, and holidays, with higher occupancy observed on weekend and holidays.

Table 10 lists the occupancy rates that were collected for the canyons during winter peak periods. On average, Big Cottonwood Canyon had slightly higher occupancy than Little Cottonwood Canyon. The average weekend vehicle occupancy rates observed during the sample data period for Little and Big Cottonwood Canyons were 1.89 and 2.14, respectively. On average, during peak weekends and holidays, 31% of vehicles were categorized as single-occupant vehicles (SOV) in the canyons.

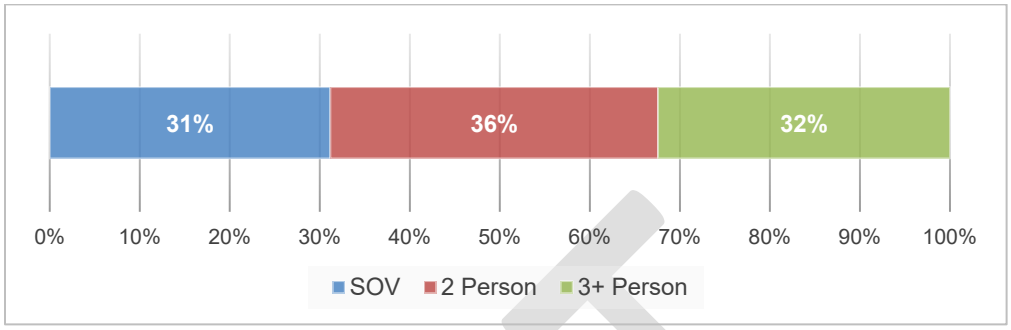
Table 10. Vehicle Occupancy in Cottonwood Canyons (2017 and 2018)

Canyon	Occupants per Vehicle		
	1	2	3+
Little Cottonwood			
Weekday (M–F)	54%	31%	12%
Weekend (S+S) and holidays	37%	37%	24%
Big Cottonwood			
Weekday (M–F)	41%	33%	23%
Weekend (S+S) and holidays	24%	35%	40%
Big and Little Cottonwood Combined Average			
Weekday (M–F)	48%	32%	17%
Weekend (S+S) and holidays	31%	36%	32%

M–F = Monday through Friday; S+S = Saturday and Sunday

Figure 7 shows the average distribution of occupancy observed from the field data. Strategies to improve vehicle occupancy or reduce SOV use could improve mobility.

Figure 7. Combined Average Vehicle Occupancy Rate for Big and Little Cottonwood Canyons on Winter Weekends and Holidays (2017 and 2018)



3.6 Trip Types

Ninety percent of trips in the canyons are recreation-based trips (Mountain Accord). Trips for ski resort employment and trips to and from canyon residences make up a small percentage (less than 10%) of home and work trip types. Trip types are an important consideration when developing a TDM strategy because travel behavior can vary depending on the reason for the trip.

In general, recreation trip types are evaluated as leisure time, which can be seen as a consumable object that could be easily switched for other leisure activities. In contrast, home-based work trips are often taken out of necessity. Although there seems to an inelastic demand for canyon travel during peak periods, recreation trips are more flexible than are home-based work trips. This flexibility makes forecasting these types of trips more challenging.

3.7 Mode Split

The predominant mode of travel in the canyons is personal vehicles. The Utah Transit Authority (UTA) operates winter bus service in the canyons to the ski resorts. UTA's current ski bus service serves between 4% and 7% of the users entering the canyons (LJ Consulting 2017).

In 2019, UTA modified its winter bus service and provided more-frequent service into the canyons. This improvement in service increased bus route capacity for transit riders. UTA and its resort partners have received positive feedback that the ski buses were at capacity during peak periods and more people were riding the bus. However, the number of vehicles on the roads in the canyons did not appear to decrease. Although this anecdotal evidence is encouraging, when this report was written, exact data regarding bus ridership were unavailable to quantify the mode split (transit versus personal vehicles) from the modification in winter bus service in 2019.

4 Predicting Mode Choice

Mode choice refers to the transportation choice such as auto, bike, or bus an individual decides to take for their trip. To develop and evaluate certain TDM strategies for the Cottonwood Canyons such as congestion pricing, a conceptual mode shift model was developed to determine the potential modal shift response to a TDM strategy. While mode choice models can vary in complexity the model for the Cottonwood Canyons was simplified due to the focus on mobility planning for peak winter travel, the predominant recreation trip type and viability of other modes namely bike and pedestrian travel. For peak winter demand the transportation mode choice can be divided between personal vehicle and transit service. Active transportation mode choices are inadequate for winter trips given the trip distance, corridor geography and nature of the trip that would require extensive personal recreation gear and belongings such as ski equipment. Given these challenges it was determined to be an unreliable mode choice offering to offset peak winter demand and excluded from the model consideration.

To influence the current mode choice profile of predominantly personal vehicles for the Cottonwood Canyons an incentive/disincentive strategy or “carrot and stick” approach to travel demand management was assumed. Assumptions to this approach are incentivizing mode shift to transit use by reduced travel times and disincentivizing personal vehicle use by the introduction of fees. The goal of this approach would achieve the behavior change needed to reduce congestion during peak period travel in the canyons.

4.1 Willingness to Pay Survey

To estimate the likelihood of users to shift from their existing mode choice of personal vehicle to a transit mode choice a Willingness to Pay Study was conducted to develop a willingness-to-pay (WTP) and value of travel time savings (VOTTS) for the Cottonwood Canyons. WTP and VOTTS are inputs to the mode shift model to determine the expected user response to an incentive/dis-incentive TDM strategy.

A WTP study was conducted as opposed to a stated preference (SP) or revealed preference (RP) survey type due to inherent simplicity of peak winter trips for the Cottonwood Canyons. The complexity of SP and RP surveys were determined to be out of scope for this project purpose.

Similar to SP studies, WTP studies are based on the principles of contingent valuation; that is, they are a method of estimating the value that a person places on a good or service. WTP studies test a person’s sensitivities to various monetary amounts by first offering a starting monetary amount or price suggestion of a medium value. Then, depending on whether the respondent says yes or no to that medium price level, the respondent is then offered a different price level. For example, if the respondent says yes to the medium price level suggestion, the approach then asks whether the respondent would pay a suggested higher price level. If the respondent says no to the medium suggested price, then the approach offers a suggested lower price level. These sets of questions are considered “experiments” since outcomes are recorded after presenting the test prices or price ranges.

Contingent-valuation studies such as WTP or SP studies go beyond the benefits of simple opinion surveys that ask how much one would pay for improved travel times and leave it to the respondent to enter a price. Or, conversely, one price is presented, and the respondents are asked whether they would pay such an amount. Studies that ask outright how much a respondent would pay or whether the respondent would pay a fixed amount are unreliable since the respondents' answers tend to be skewed against paying any amount, even though there are obvious economic benefits to users.

4.2 Survey Screening Requirements

The target population for the WTP study focused on residents in Davis, Salt Lake, Summit, and Utah Counties who visited the ski resorts during the winter season at least once within the past 5 years. The market research company Lighthouse Research & Development, Inc., randomly phoned households in the area during July and August 2019 in order to achieve at least 1,000 completed surveys. At the end of the survey, 658 respondents said they had visited the ski resorts in the winter within the past 5 years and so were potential respondents for the WTP experiments as part of the general survey questionnaire that is available in the *Cottonwood Canyons Willingness-to-pay Survey Report* (HDR 2019). Note that all statistical estimates in this report are based on weighted observations to better represent the tendencies in the general population across the four targeted counties.

4.3 WTP Survey Experiments

Three different experiments were designed in order to capture respondents':

1. willingness to pay for improved travel times regardless of mode,
2. willingness to pay for improved travel times offered by a new, improved transit mode, and
3. willingness to pay for the convenience of driving a personal vehicle even with other modes available.

In the introduction of the survey, the respondents were told that the purpose of the survey is to better understand the decision that drivers make when selecting transportation choices to destinations at Cottonwood Canyon ski resorts and recreation areas. The concept of paying an access toll was not explicitly stated in the survey so as not to bias the experiments, since people generally have negative attitudes toward tolls.

The next section of this report with highlight the key findings of the survey and how the results can be interpreted for use in predicting mode choice. In depth detail on the survey methodology and the experiment results are available in the *Cottonwood Canyons Willingness-to-pay Survey Report* (HDR 2019).

4.4 Key Findings

After completing of the survey, either a plurality or a majority of the respondents said that they would pay as high as the highest price levels they were presented. Specifically, 49% of respondents were willing to pay the high price levels for improved travel time using a hypothetical route presented in WTP Experiment 1, and 57% were willing to pay the high

price levels for faster travel time using a new, improved transit system in WTP Experiment 2. Given that the sample of respondents was randomly drawn from local users in the catchment area of Big and Little Cottonwood Canyons, the study has revealed a potential for local visitors to the resorts to pay for improved travel time.

Experiment 3 took a different approach than WTP Experiments 1 and 2 in valuing mode choice by testing the value respondents placed on using their personal vehicles to reach the resorts rather than using alternative transportation options. This experiment showed that 55% of those who participated in WTP Experiment 3 were willing to pay the high price levels to continue using their personal vehicles.

The study showed a correlation in respondents' higher willingness to pay or not willingness to pay by certain age groups, income levels, most frequent mode choice, and the presence of children under the age of 10. Differences in WTP levels by respondent attributes varied across the experiments, but overall they are fairly intuitive and logical in their comparative relationships.

4.4.1 Age Group

For example, the first WTP experiment showed those in the *35–44* age group had the highest willingness to pay across all age groups at a rate of 57% compared to the average of 49%. This age group is typically well established in careers and family and can afford the higher price levels to reach the ski destinations more quickly. The second WTP experiment had a slightly different outcome, with the *25–34* age group having the highest rate (62%) in choosing the high price levels, whereas the *35–44* age group was nearly the same (57%) as the overall respondent group (57%). Interestingly, the *18–24* age group tied with the *35–44* age group, which had the highest rate of selecting the medium price levels when valuing a new, improved transit system at 28% compared to the average of 24%. With respect to the third WTP experiment, the younger generations had a higher valuation for the use of their personal vehicles even with other alternative modes available, with 65% of the *25–34* age group selecting the high price levels compared to the group average of 55% and 30% of the *18–24* age group selecting the medium price levels compared to the average of 23%.

4.4.2 Household Income

As expected, pretax annual household income ranges showed differences in willingness to pay for the high price levels across the three WTP experiments as income grew from *Less than $25,000* to *$250,000 or More*. For example, respondents in the *$250,000 or More* income category selected the high price levels at rates of 74%, 62%, and 62% for WTP Experiments 1, 2, and 3, respectively.

4.4.3 Most Frequently Used Mode

Question 15 of the survey asked about respondents' most frequently used mode to reach their ski destinations in either of the canyons. Not surprisingly, respondents who traveled using an SOV most frequently within the past 5 years had the highest rates of refusing to pay for any travel improvements presented in WTP Experiments 1 and 2 (22% and 18%, respectively) compared to the group averages of 16% and 9%. These lower rates suggest an inertia for those favoring the "free" SOV mode against changes to their status

quo. For those respondents who qualified to do the third WTP experiment, this group also had the highest rate of refusing any price level for use of a personal vehicle to reach the ski resort areas (17%) compared to the group average of 12%.

4.4.4 Frequently of Traveling with Children

The study showed that time savings and/or mode comfort offered by a personal vehicle are valued by those who travel with young children. Interestingly, respondents who said that they frequently travel with children under the age of 10 (Q16) had the highest rates of selecting the high price levels in all three experiments, with values of 68%, 64%, and 68% compared to the WTP Experiment 1, 2, and 3 group averages of 49%, 57%, and 55%, respectively.

4.4.5 Cross-tabulation Results

After respondents completed the WTP experiments for which they qualified, the study explored their preferences for switching to other transportation modes, desiring faster travel time, and desiring predicable travel time. A cross-tabulation of these questions by differing WTP levels in the three types of experiments showed a strong positive correlation between the WTP level and the question's importance level.

Highlights of the cross-tabulations are presented below.

Likelihood to Switch to Transit

The survey found that respondents' willingness to pay the high price levels for improved travel time was correlated with their likelihood of switching to an alternative transportation mode.

- In **Experiment 1**, respondents' willingness to pay the high price levels for improved travel time ranged from a low of 36% (compared to the group average of 49%) for those who said they were not likely to switch to an alternative transportation mode to a high of 61% for those who said they would be extremely likely to switch.
- Similarly, in **Experiment 2**, respondents' willingness to pay the high price levels for improved travel time ranged from a low of 39% (compared to the group average of 57%) for those who said they would pay the high price levels even though they would not likely switch to an alternative transportation mode to a high of 65% for those who said they would be extremely likely to switch.
- In **Experiment 3**, the trend continued. In Experiment 3, respondents' willingness to pay the high price levels for improved travel time ranged from a low of 36% (compared to the group average of 55%) for those who said they would pay the high price levels even though they would not likely switch to an alternative transportation mode to a high of 69% for those who said they would be extremely likely to switch.

Importance of Faster Travel Time

The survey found that respondents' willingness to pay the high price levels for faster travel time was correlated with their placing a greater importance on faster travel time.

- In **Experiment 1**, respondents' willingness to pay the high price levels for faster travel time ranged from a low of 22% (compared to the group average of 49%) for those who placed no importance on faster travel time to a high of 66% for those who said they considered faster travel time to be extremely important. group rate average was 49%.
- **Experiment 2** showed a similar trend. In Experiment 2, respondents' willingness to pay the high price levels for faster travel time ranged from a low of 37% (compared to the group average of 57%) for those who placed no importance on faster travel time to a high of 66% for those who said they considered faster travel time to be extremely important.
- However, in **Experiment 3**, the low-importance respondents were even less likely willing to pay, and the high-importance respondents were even more willing to pay. In Experiment 3, respondents' willingness to pay the high price levels for faster travel time ranged from a low of 29% (compared to the group average of 55%) for those who placed no importance on faster travel time to a high of 75% for those who said they considered faster travel time to be extremely important.

Importance of Predictable Travel Time

The survey found that respondents' willingness to pay the high price levels for faster travel time was correlated with their placing a greater importance on predictable travel time.

- In **Experiment 1**, respondents' willingness to pay the high price levels for faster travel time ranged from a low of 21% (compared to the group average of 49%) for those who did not place an importance on predicable travel time to a high of 68% for those who said that predictable travel time were extremely important.
- Similarly, in **Experiment 2**, respondents' willingness to pay the high price levels for faster travel time ranged from a low of 37% (compared to the group average of 57%) for those who did not place an importance on predicable travel time to a high of 65% for those who said that predictable travel time were extremely important.
- Finally, in **Experiment 3**, respondents' willingness to pay the high price levels for faster travel time ranged from a low of 29% (compared to the group average of 55%) for those who did not place an importance on predicable travel time to a high of 68% for those who said that predictable travel time were extremely important.

The study showed that, depending on the experiment, either a plurality or the majority of respondents were willing to pay the high price levels to improve travel times from just before the base of the canyons to either of the ski resorts in Big or Little Cottonwood Canyon. HDR cross-tabulated respondents' preferences by their level of agreement with their likelihood to consider an alternative transportation option and the importance they placed on faster and predictable travel times. The results of this cross-tabulation validate the candidness of the respondents' price level choices.

The study's results indicate that there is a demand among local canyon users for improved travel times and an openness to considering alternative transportation modes, but there is still a level of inertia to continuing to use personal vehicles. Given that over half of respondents valued the use of a personal vehicle enough to select the high price levels presented to them, it would definitely be viable to implement a fee.

The study's findings collected through random sampling of over 1,000 households across the four targeted counties of Davis, Salt Lake, Summit, and Utah can support UDOT's Plan insomuch as the results can facilitate the level and type of user fees and types of transit improvements that can best address the travel congestion and delays experienced by people visiting either canyon.

4.5 Mode Shift Model

In order to evaluate the TDM strategy, the analysis team developed a conceptual mode shift model to test the performance of various fare structures. This section explains how the model functions to estimate the percentage of daily visitors split by personal vehicle and transit for trips into the Cottonwood Canyons during peak periods.

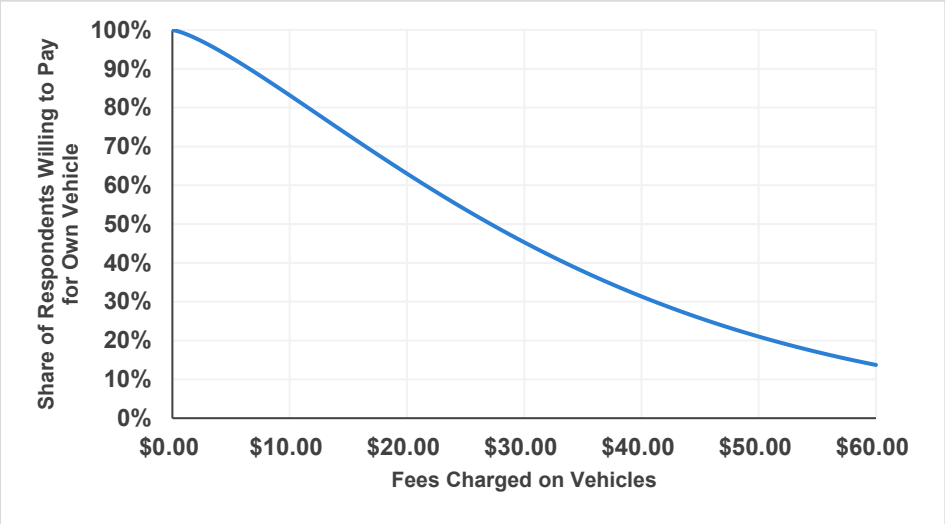
The mode shift model function can be described as a respondent's answer to the following two questions:

1. Would you pay a price to travel in your personal vehicle?
2. If not, would you be willing to ride transit to make your trip?

First, to model a respondent's answer to question 1, the analysis team developed the curve in Figure 8. This curve was developed from the WTP results from Experiment 3, which explored the valuation of a personal car's comfort and convenience. This curve illustrates the percentage of users who would pay to drive their personal vehicle at a given fee. In that situation, the median willingness to pay was $27 per trip. Still, a notable portion of the respondents were willing to pay about $50 or more to continue using a personal vehicle to make the trip to the ski resorts in Big or Little Cottonwood Canyon rather than using another mode.

By using this curve in the model, the analysis team modeled what percentage of users would pay a given fee to make their trip in their personal vehicle. For example, at a fee of $10, 83% of users are estimated to pay to make their trip in a personal vehicle.

Figure 8. User Response Curve to Fee on Private Vehicle



The mode shift model then subjects the 17% of users who would *not* pay a fee to question 2. To model a respondent's answer to question 2, the analysis team developed the curve in Figure 9 using the WTP results from Experiments 1 and 2.

Figure 9. User Response Curve to Fee for Transit

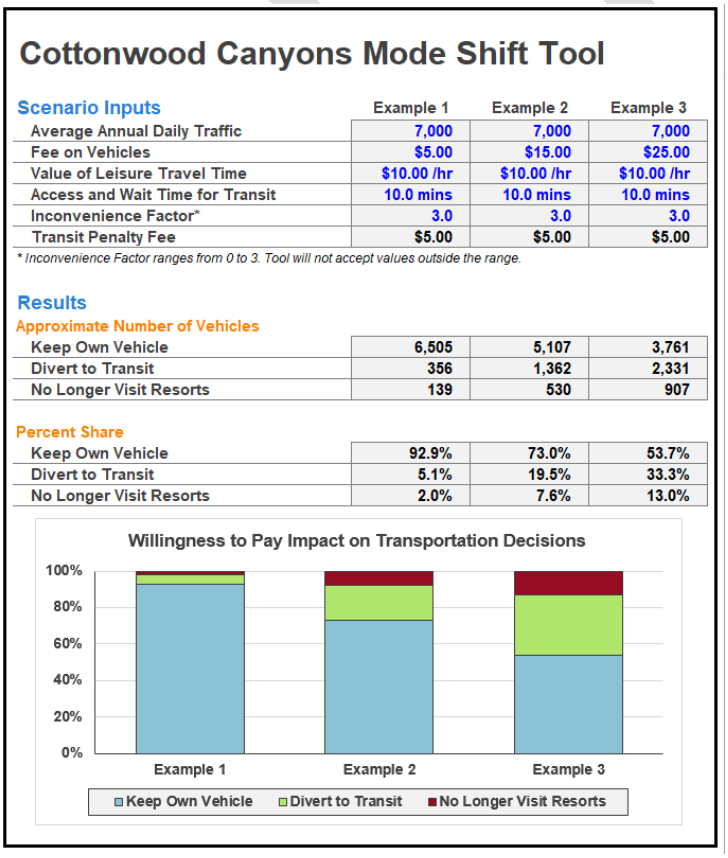
The analysis team's development of the TDM strategy includes the assumption that UDOT is considering offering a free, new, improved transit option. However, in order to predict the shift in mode, even for free transit, the analysis team needed to factor in the VOTTS penalty for the inconvenience of accessing and waiting for transit. To estimate a user's willingness to take transit, a comprehensive penalty time value must be developed. The equation for this value is:

$$\frac{\$10/\text{hour} \times 10 \text{ minutes out-of-vehicle time}}{60 \text{ minutes}} \times 3 = \$5$$

When transit is presented as a viable mode choice, one needs to factor in the penalty effect on VOTTS due to the time people are outside a vehicle because they have to walk to access transit and then wait for the next transit vehicle. The numerator in in the equation above is the VOTTS of $10 developed from the WTP study multiplied by the transit wait time, which is estimated to be 10 minutes. Following the U.S. Department of Transportation (USDOT) Guidance (USDOT 2014), the average penalty is valued at 100% of hourly income, with a range from 80% to 120%. This amounts to doubling the VOTTS from this study by a factor of 2. For this study, the analysis team recommends using a penalty factor of 3 given the urgency with which skiers want to reach the resorts to make use of the full day.

The result of this equation gives a value of $5, which is a monetized penalty time value. The mode shift model uses this value to estimate how the 17% of users will respond to question 2, even with free transit. In the example in Figure 10, 72% will choose to ride transit, while 28% will choose not to make the trip at that time.

Figure 10. Demonstration of Cottonwood Canyons Mode Shift Tool



Cottonwood Canyons Mode Shift Tool

Scenario Inputs	Example 1	Example 2	Example 3
Average Annual Daily Traffic	7,000	7,000	7,000
Fee on Vehicles	$5.00	$15.00	$25.00
Value of Leisure Travel Time	$10.00 /hr	$10.00 /hr	$10.00 /hr
Access and Wait Time for Transit	10.0 mins	10.0 mins	10.0 mins
Inconvenience Factor*	3.0	3.0	3.0
Transit Penalty Fee	$5.00	$5.00	$5.00

* Inconvenience Factor ranges from 0 to 3. Tool will not accept values outside the range.

Results

Approximate Number of Vehicles

Keep Own Vehicle	6,505	5,107	3,761
Divert to Transit	356	1,362	2,331
No Longer Visit Resorts	139	530	907

Percent Share

Keep Own Vehicle	92.9%	73.0%	53.7%
Divert to Transit	5.1%	19.5%	33.3%
No Longer Visit Resorts	2.0%	7.6%	13.0%

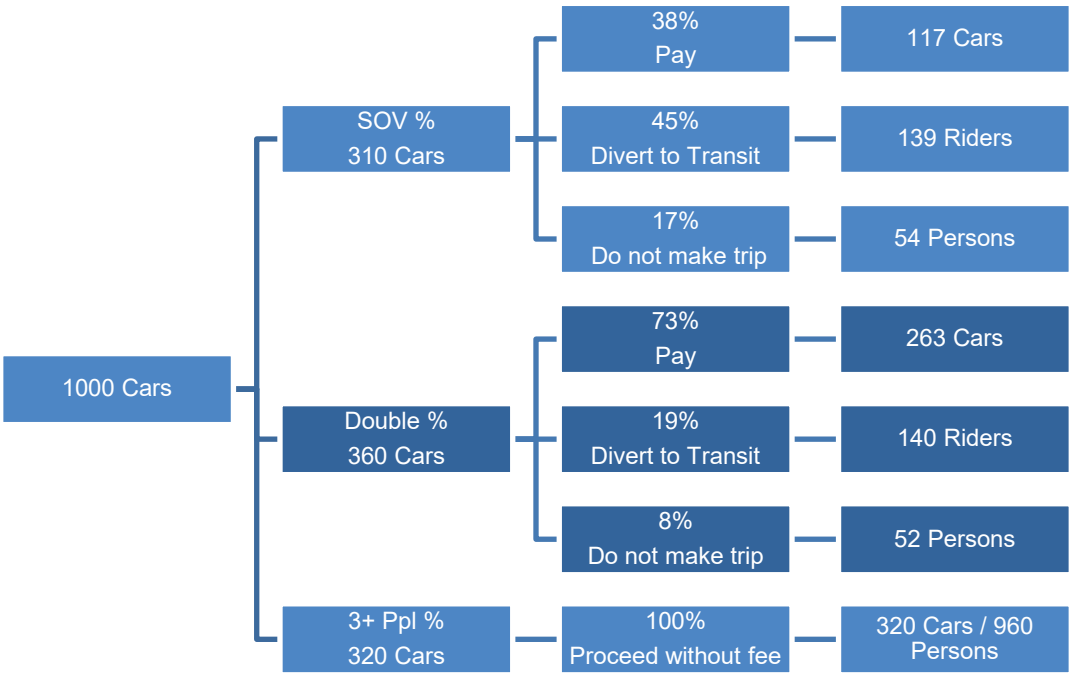
Figure 10 above is a screen capture of the mode shift model, a Microsoft Excel–based tool developed with a simple user interface to input values for a fee-based TDM strategy. This example is of different fees imposed on a daily traffic volume of 7,000 vehicles and the resulting response to those fees. This model is being used by the analysis team to answer three questions that are important elements of developing a TDM strategy:

3. Estimate the performance of a TDM strategy to reduce vehicle demand on canyon roads
4. Estimate transit rider demand under a fee-based TDM strategy
5. Assist in conceptual fee collection potential

To estimate user behavior and assign a response to this fare structure, the analysis team used a combination of the average occupancy profile from Figure 7, Combined Average Vehicle Occupancy Rate for Big and Little Cottonwood Canyons on Winter Weekends and Holidays (2017 and 2018), above and the mode shift tool described in Section 4.5, Mode Shift Model.

For an illustration of the assignment methodology used for this scenario, see Figure 11, which shows an example mode shift during a peak hour.

Figure 11. Illustration of Mode Shift Methodology



For the sake of simplicity, the analysis team choose a sample peak hour of 1,000 vehicles. The first step was to group the example 1,000-vehicle demand by occupancy (SOV, two people, or three or more people).

Second, each occupancy category was subjected to the example fare for its specific occupancy and was subsequently split based on the predicted response (pay, divert to transit, do not make trip, or proceed without fee). For this response, it is important to remember that the analysis assumes a free and reliable transit system with adequate

parking for users who choose to divert to transit. The analysis team did not make any assumptions about users' propensity to carpool. Although carpooling could be expected, we did not have enough information to estimate this net effect on mode shift. For this reason, we assume that any user who is not willing to pay a vehicle fee will divert to transit. This assumption also supports the goal of reducing peak-hour personal vehicle demand. We also made an assumption that some users will choose to not make the trip at all and will instead choose another destination or travel during a different time with a lower fee.

The resulting performance of this scenario could reduce the peak-hour demand by an estimated 290 vehicles during this example peak hour with 1,000 vehicles, thereby achieving the needed mode shift to improve mobility in the canyons.

5 TDM Strategy Development

This section identifies different strategies that UDOT could implement in the Cottonwood Canyons to help mitigate congestion and improve mobility. To reduce congestion, roughly one-third of vehicle users would need to shift modes (from personal vehicles to transit) during peak periods.

The Little Cottonwood Canyon EIS is using the 30th ranked peak hour or 85th percentile to develop mobility alternatives. In 2017, the 30th-highest hour was 1,061 vehicles, and in 2050 it is projected to be 1,546 vehicles. The traffic analysis conducted for the EIS determined that, with no action taken in the canyons, mobility will decrease when roadway traffic increases above 900 to 1,000 vehicles per hour. In support of the Little Cottonwood Canyon EIS, UDOT is evaluating TDM strategies in their effectiveness to support the goal of keeping the number of vehicles in the canyon below a target of 1,190 vehicles per hour. The following strategies have been identified to achieve that goal.

5.1 Tolling

Tolling is widely implemented by transportation entities as a TDM strategy to influence users' behavior change or create a revenue stream. Tolling in the Cottonwood Canyons could be implemented in a variety of scenarios, such as simple flat fee similar to an entry fee or a more complex method called *congestion pricing* in which the toll rate varies depending on traffic. Congestion (or variable) pricing is in use in areas around the United States and the world.

For both Big and Little Cottonwood Canyons, variable pricing might need to be considered. For example, drivers could be offered a discount if they travel during off-peak periods. This type of toll structure would encourage drivers to shift modes during peak use or to drive during off-peak or discount periods.

Congestion pricing can be implemented on an entire road or on a specific lane with a managed-lane technique. The express lanes on Utah's Interstate 15 (I-15) are managed lanes with congestion pricing. Drivers of single-occupant vehicles (SOV) can pay a variable toll to drive in a dedicated lane. The fee, which varies by traffic congestion, uses a distance-based structure in which SOV drivers can pay by various sections of the freeway. This express lane is free to users who have two or more people in their car and to other vehicle classes.

This section evaluates different tolling scenarios and provides conceptual mode shift estimates and the resulting amount of estimated user fees paid. Note that the potential estimated fees paid are preliminary and conceptual. If UDOT desires a firm estimate of revenue, a more robust tolling and revenue study should be completed.

These estimates should not be viewed as revenue development. They should be considered conceptual and exploratory in nature, and they are not intended as an investment-grade study or analysis. The goal of this report is to give UDOT conceptual insight into different toll strategies, fare structures, and resulting performance to support mobility improvements for the Cottonwood Canyons. Conceptual analysis was considered by UDOT and the analysis team suitable to support the needs of the Little Cottonwood Canyon EIS.

It is also important to note that no specific toll amount is being evaluated in the Little Cottonwood Canyon EIS at this time. Tolling is being evaluated in this report as a mechanism to make transit more attractive. Tolling private vehicles (disincentives) and providing faster transit times (incentives) are necessary to offset the perceived inconvenience of transferring from vehicle to bus, especially with winter gear. An advantage of tolling and the resulting revenue is that it could help pay for canyon transportation or transit improvements.

5.1.1 Scenario 1: Year-round Flat Fee

The simplest toll would be a flat fee imposed on all vehicles entering the canyons regardless of time of day or vehicle occupancy. This scenario could function similarly to the entry fee for Millcreek Canyon, which is about 6 miles north of Big Cottonwood Canyon. The toll amount evaluated under this scenario was $3 to $5 and was implemented year-round. The disadvantage of this scenario is that, though it would generate revenue, it would not provide the disincentive needed to address the mobility issues in the canyons during peak periods. A higher fee was not considered reasonable to implement year-round because transit is not available to users outside the winter months. Table 11 shows the performance of this scenario.

Table 11. Scenario 1 Performance

Fee	Mode Shift	Number of Days per Year Implemented
$3–$5 per vehicle	2%–7%	365
Conceptual Fee Collection		
Year	**Total Fees (millions)**	
2030	$7–12	
2040	$8–13	
2050	$9–15	

5.1.2 Scenario 2: Peak-period Fee

A more complex scenario would be a congestion-pricing or variable fee implemented only during peak periods, which are predominantly winter weekends and holidays. At all other times under this scenario, there would be no fee. Two different implementation options were evaluated under this scenario to influence travel behavior.

- Option 1: Flat fee of $20 to $30 for all vehicles
- Option 2: Occupancy-based vehicle fee

Table 12 shows an example fee structure and the performance of these two options. This fee structure was developed based on the user response curves in Section 4.5, Mode Shift Model, and the mode shift performance goal needed to improve mobility in the canyons. At the $20 to $30 toll rate, about 550 vehicles or about 1,200 skiers (assuming an average vehicle occupancy of 2.17 people) per day might no longer visit the ski resorts in Little Cottonwood Canyon, instead going to other ski resorts.

Table 12. Scenario 2 Performance

	Fee	Occupancy	Mode Shift	Number of Days per Year Implemented
Option 1	$20–$30	Not applicable	35%–55%	About 40
Option 2	$25–$30	Single (SOV)	46%–62%	
	$10–$15	Double (2 people)	17%–27%	
	Free	Three or more people	Not applicable	

Conceptual Fee Collection		
	Total Fees (millions)	
Year	Option 1	Option 2
2030	$5–6	$3–4
2040	$6–7	$3–4
2050	$7–8	$4–5

5.1.3 Scenario 3: Variable Year-round Fee

This scenario is a hybrid of scenarios 1 and 2, option 1, in which a year-round fare is implemented and the rate varies based on peak travel. This scenario resembles a more traditional congestion pricing model in which a flat fee is in place and the fee rises with congestion or goals of the lane management.

The fee structure in scenario 1 would be in place during off-peak times (an estimated 82% of annual trips), and the fee structure in scenario 2, option 2, would be in place for peak-period travel (an estimated 18% of annual trips) to influence travel behavior. Under this scenario, there is potential for both revenue and mobility needs to be addressed.

This scenario yields the highest potential for fee collection of the three proposed scenarios given the year-round fee and also assessing a fee during peak periods. Table 13 shows an example fare structure and its performance.

Table 13. Scenario 3 Performance

Fee	Occupancy	Mode Shift	Number of Days per Year Implemented
Peak Periods (Estimated 18% of Trips)			
$20–$30 per vehicle	Not applicable	35%–55%	About 40
Off-peak Periods (Estimated 82% of Trips)			
$3–$5 per vehicle	Not applicable	2%–7%	About 325
Conceptual Fee Collection			
Year	**Total Fees (millions)**		
2030	$11–15		
2040	$13–17		
2050	$14–19		

5.2 Carpool Rule

Another form of TDM would be to exclude certain vehicles from entering Big and Little Cottonwood Canyons based on occupancy and require those users to carpool or ride transit. This strategy could be enforced along with peak-period travel for mobility improvement in the canyons and less user friction.

An example of this strategy could be to restrict SOVs from entering the canyons during the morning hours or during the entire day during peak periods. The existing data discussed in Section 2.5, Vehicle Occupancy, show that SOVs are 31% of vehicles during peak periods. This strategy could be implemented during morning peak hours only when travel demand is highest or during an entire peak day. Implementing such a "carpool rule" in the morning would allow SOV drivers who are not interested in changing their behavior to shift their travel toward the less-busy afternoon hours when fewer vehicles are entering the canyons. This strategy might be undesirable given the in-canyon parking constraints but would allow more user flexibility.

During an example busy winter day when 6,000 vehicles enter each of the Cottonwood Canyons, a carpool rule could shift about 1,800 vehicles in each canyon, and about 300 vehicles during each peak morning hour.

Enforcing a carpool rule would present some challenges depending on the degree of compliance that UDOT wants. Occupancy readers or other technologies could be implemented to determine the number of vehicle occupants, and license plate scanners could be added to support ticket-by-mail enforcement. However, the current technologies and other forms of enforcement, such as law enforcement needing to watch vehicles entering the canyon, could limit the effectiveness of this strategy. Violators would be fined for not meeting the occupancy requirements or for entering during peak hours. To avoid being in an SOV, some single occupants might carpool, which would also improve traffic conditions by reducing the number of vehicles in the canyons.

With this strategy, a fee for violations would need to be implemented similar to the I-15 express lanes fee, which is $337. Estimating fee collection for this strategy cannot be

conceptualized because the analysis team does not have good data regarding users' propensity to break the rule.

Eliminating SOVs might increase carpooling, but the reduction in the number of vehicles might not be as large as with the tolling scenarios or effective enough to reduce congestion. Thus, during certain periods, a more aggressive strategy might be needed to restrict single- and double occupant vehicles from entering the canyons.

5.3 Ski Resort Parking Fee

A parking fee at Cottonwood Canyon ski resorts could function as a standalone TDM strategy. This strategy would require the ski resorts to implement a parking fee for users at a high enough rate to encourage users to carpool or ride transit. This strategy could be considered a *de facto* toll and could potentially yield a similar mode shift. This strategy presents a challenge as a TDM option for UDOT because UDOT cannot require the ski resorts to implement a parking fee, nor is UDOT in a position to manage such a program to improve mobility due to land ownership of the parking areas. The ski areas are However, UDOT needs to be well-positioned to respond if all ski resorts in the Cottonwood Canyons were to implement a parking fee. It is foreseeable that all resorts could implement a parking fee, and in this case a cooperative approach between all parties would need to be developed to achieve successful mobility improvements.

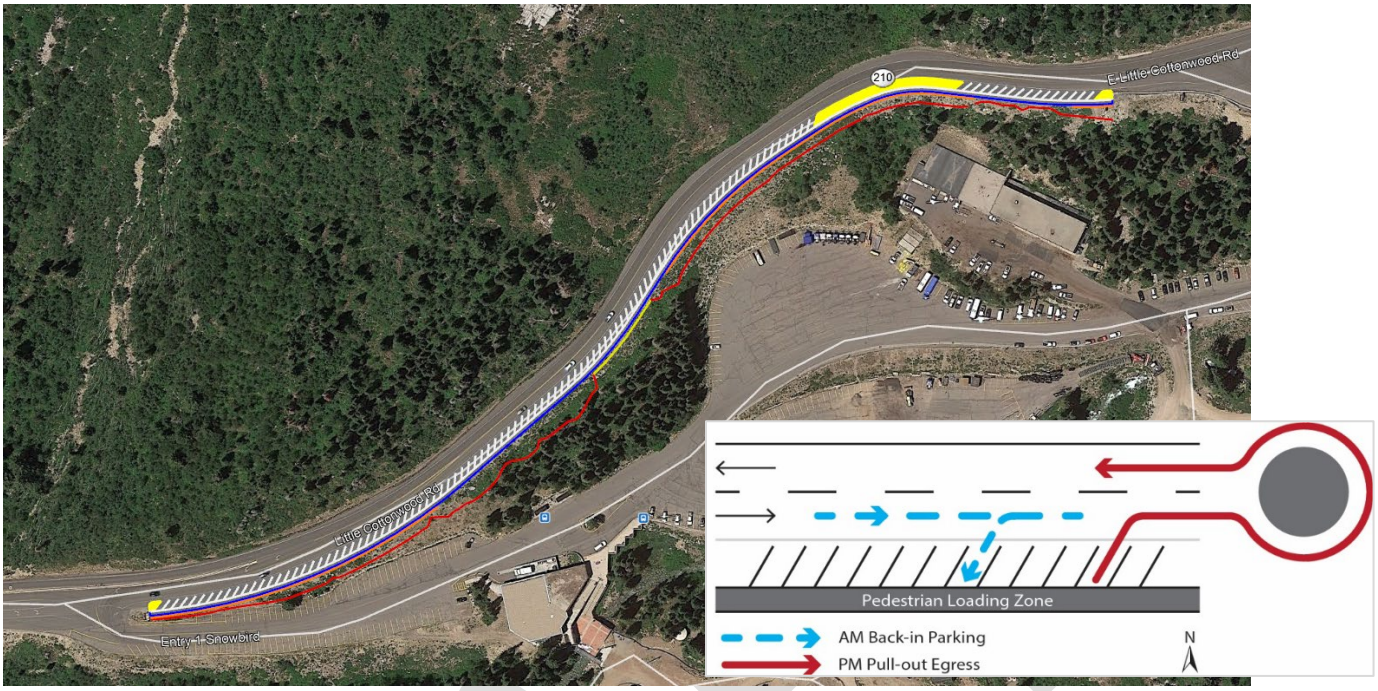
Solitude Ski Resort implemented a parking fee for its 2019–2020 ski season. Its fare structure is occupancy-based, and a season parking pass can be purchased to bypass daily occupancy-based fees. The three other resorts in the canyons did not have blanket parking fees in place when this report was written, but it is within their authority to implement them if they desire.

If all resorts implement a parking fee, UDOT would need to consider the viability of the tolling scenarios identified in Section 5.1, Tolling. Implementing a toll in addition to a resort parking fee could be excessively punitive to users, and the combined toll and fee might not be needed to achieve mobility improvements. Under a cooperative approach, UDOT could work with the ski resorts to potentially modify their resort parking fee program if a tolling option is desired. Another TDM option for UDOT to consider would be to implement the Carpool Rule Scenario identified in Section 5.2, Carpool Rule, in addition to a resort parking fee. This scenario would be less punitive for users and would achieve similar TDM performance.

5.4 No Roadside Parking or Parking Management

With this strategy, UDOT would either eliminate all roadside parking or formalize and manage roadside parking areas. Roadside parking is currently allowed during the winter. Figure 12 shows a concept for formalizing roadside parking on S.R. 210 above Snowbird Entry 1. The benefit of this strategy is that it would help traffic operations by eliminating conflicts with snow removal and congestion caused by roadside parking.

Figure 12. Concept for Formalizing Roadside Parking on S.R. 210 above Snowbird Entry 1



Although the ski resorts have authority to manage their parking areas, currently users have the option to park on the roadside shoulders, which are managed and maintained by UDOT. If resort-area parking fees are implemented, skiers could park on the roadside shoulders to avoid paying the parking fees. Formalizing parking areas could mitigate this risk by providing a clear number of stalls and demarcating no-parking areas. The analysis team recommends a coordinated approach between UDOT the ski resorts and other canyon authorities to ensure that mobility and safety are not sacrificed if resort parking fees are implemented.

Although removing roadside parking or formalizing it will provide benefits, this strategy might not reduce peak-hour travel. Typically, the peak hour occurs between 8 AM and 9 AM when there are parking spaces available at the ski resort parking lots. Eliminating roadside parking would affect skiers who typically arrive after the peak hour. Since this strategy would not likely reduce peak-hour traffic, it is not recommended as a stand-alone TDM strategy for mobility improvement, but it might be considered by UDOT to improve safety by eliminating the conflict between parked vehicles and road traffic and conflicts between pedestrians on the road and moving traffic.

6 Enforcement Technology

Both tolling and carpool rule strategies would require technology solutions to support enforcement. A toll booth at the entrance to each canyon would not support the goal of improving mobility and reducing congestion. Instead, it could make travel time worse even with a reduction in the number of vehicles during the peak hours. Thus, a dynamic tolling system would need to be implemented.

These systems vary in complexity and type. The technology solution includes hard infrastructure and equipment that would need to be constructed and installed at the entrance to the canyon and also companion software solutions to handle photos, payments, image, fee and data processing. With these systems, users also typically have transponders in their vehicles (such as with the I-15 Express Pass) that communicate with tolling systems and process fees. Most typically, these tolling systems have a gantry that spans the roadway or is adjacent to the travel lane. The gantry supports devices such as license plate readers, video cameras, and occupancy-detection devices. The cost of this type of system is estimated to be $500,000 to $2.5 million per installation including design and back office systems integration and development.

Vehicle-occupancy-detection (VOD) systems are the most costly and complex type of dynamic tolling system. These systems are maturing, but they have high costs and there are concerns about reliability. The strategies described in this report could require a way to verify the number of occupants per vehicle. The analysis team stopped short of specifying a methodology after discussions with tolling system managers at UDOT's Traffic Operations Center. Ideally, any tolling solution that is implemented in the Cottonwood Canyons would be an extension of other toll operations that UDOT had already implemented. UDOT told the analysis team that a "one-off" (separate) solution is not desired specifically for the canyons. It would be impractical to have different tolling equipment and fee-processing software in the canyons that did not integrate with the rest of UDOTs' tolling enterprise. If a tolling system is implemented for the Cottonwood Canyons, the analysis team recommends that UDOT extend the current tolling solution to the canyons. In 2020, UDOT is testing a new method of verifying vehicle occupancy for the I-15 express lanes using a smart phone application. The analysis team investigated various technologies for implementing tolling in the Cottonwood Canyons. Table 14 summarizes the analysis team's research.

Table 14. Tolling Technology Overview

Technology	Vehicle Requirement	Enforcement Infrastructure	Consumer Cost	Operator Cost
Dedicated short-range communication (DSRC) (e.g., EZPASS)	On-board transponder unit	DSRC reader / LPR	Medium	Medium
License plate recognition (LPR)	License plate	LPR	None	Medium to high
Radio frequency identification (RFID)	RFID tag	RFID reader / LPR	Low	Low
Smartphone app	Phone	LPR / smartphone GPS	Low (app fee)	Medium to high
Vehicle occupancy detection	Depends – RFID, license plate, or DSRC	VOD sensors / LPR / DSRC or RFID	Low to medium	Highest

Source: Czako, 2019

7 Federal Toll-authorizing Programs

At the inception of what is now the federal-aid highway program, Congress opposed the tolling of federal-aid highways. Since then, through Title 23 of the United States Code (USC) and other statutes, Congress has established exceptions to the general prohibition on tolling, recognizing the role that tolling can have in managing congestion and generating for rehabilitating projects and expanding transportation mobility. This section provides an overview of tolling programs and the Federal Highway Administration's (FHWA) role in granting tolling authority.

7.1 Toll-authorizing Programs

Congress established its initial opposition to tolling federal-aid highways in the 1916 forerunner of today's federal-aid highway program which provided federal aid to States for construction and maintenance of roads. Section 1 of the Federal-Aid Road Act states that "all roads constructed under the provision of this Act shall be free from tolls of all kinds." Since then, Congress has established exceptions to the general prohibition on tolling federal-aid highways.

- **23 USC Section 129, General Toll Program:** allows a toll program to support highway, bridge, and tunnel construction and reconstruction.[1]
- **23 USC Section 166, HOV/HOT Lanes Program:** allows tolling vehicles that would not previously qualify to use a high-occupancy vehicle (HOV) facility, thus creating a high-occupancy toll (HOT) facility.[2]

In addition, two toll-authorizing pilot programs permit tolls on federal-aid highways:

- **Value Pricing Pilot Program (VPPP):** allows tolling for the purpose of congestion relief.[3]
- **Interstate System Reconstruction and Rehabilitation Pilot Program (ISRRPP):** allows tolling interstates for the purpose of their rehabilitation and reconstruction.[4]

7.1.1 Definitions

To further clarify the applicability of these programs, *interstate highway* and *federal-aid highway* are defined as follows:

- **Interstate highway:** a public highway eligible for federal aid and a component of the Dwight D. Eisenhower National System of Interstate and Defense Highways described in 23 USC Section 103(c). Interstate highways are components of the broader National Highway System.
- **Federal-aid highway:** a public highway eligible for assistance other than a highway functionally classified as a local road or rural minor collector.

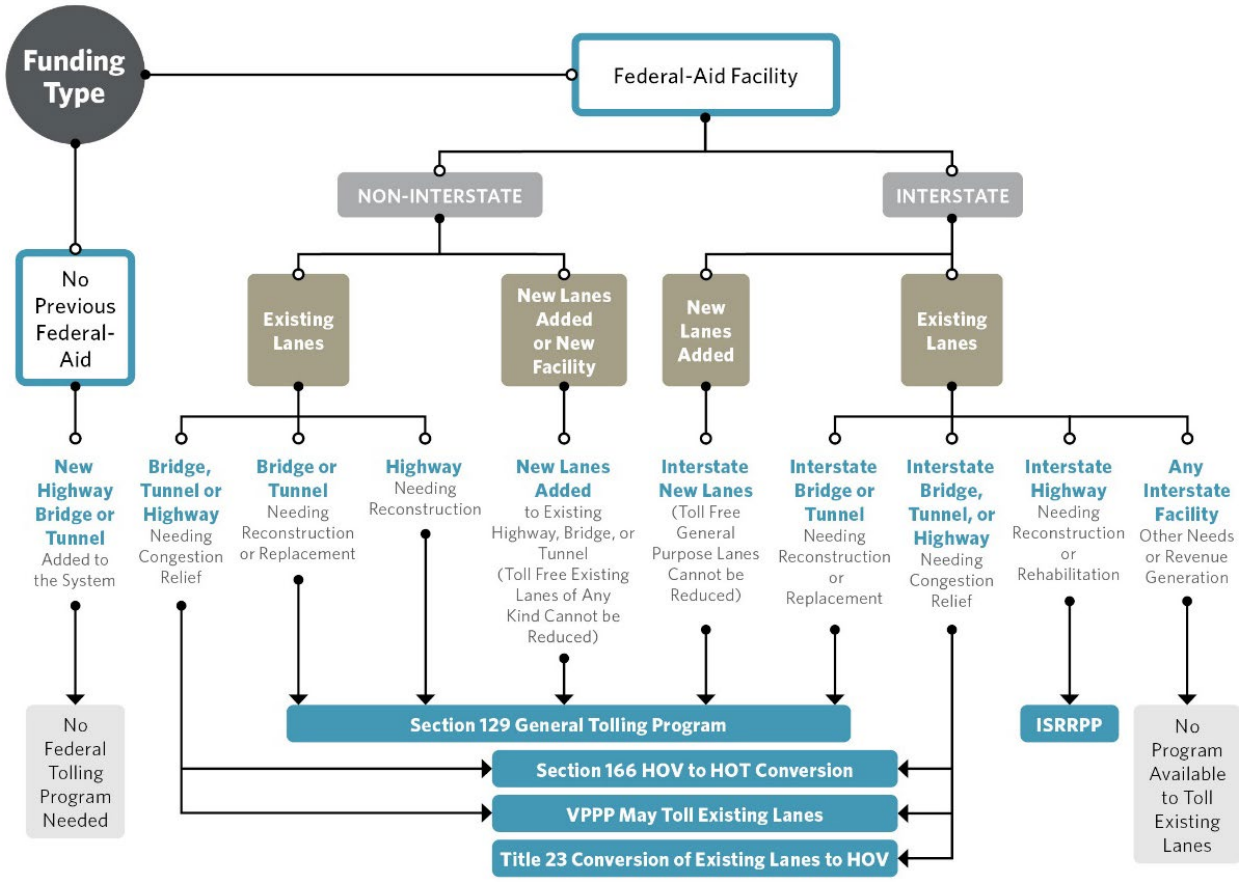
[1] https://www.law.cornell.edu/uscode/text/23/129 (23 USC Section 129)
[2] https://www.law.cornell.edu/uscode/text/23/166 (23 USC Section 166)
[3] https://www.law.cornell.edu/uscode/text/23/149 (23 USC Section 149, Notes)
[4] https://www.law.cornell.edu/uscode/text/23/129 (23 USC Section 129, Notes)

7.1.2 Criteria for Selecting a Tolling Program

The federal tolling programs use a few major criteria to determine the appropriate method for seeking authority to toll (Figure 13):

- Whether the facility has received federal aid in the past;
- Whether it is an interstate or non-interstate;
- Type of facility (highway, bridge, or tunnel);
- Whether new capacity is being added to the facility; and
- The purpose of and need for tolling.

Figure 13. Federal Tolling Program Diagram



These programs and FHWA's and the U.S. Department of Transportation's (USDOT) approach to these programs in administration and agreements may change or vary among FHWA Division Offices; therefore, close coordination with the FHWA Division Office is the best way to develop a detailed path to project completion and acceptance.

7.2 S.R. 210 in Little Cottonwood Canyon

S.R. 210 in Little Cottonwood Canyon is a minor arterial that has used federal-aid funding historically. As a result, the authorization to toll this road must come from one of the tolling programs or pilot programs in Title 23 of the USC.

The S.R. 210 Project's purpose for tolling is to reduce congestion and fund alternative modes of transportation in the canyon. It does not include reconstructing or rehabilitating S.R. 210,and the road is not currently an HOV facility. As a result, the only federal tolling program for which S.R. 210 appears to qualify is the VPPP. Background and details regarding all tolling programs are available in section 7.4 of this report, with the VPPP discussed in more detail in the following section.

7.2.1 Value Pricing Pilot Program (VPPP)

The VPPP is included in 23 USC Section 149 (Notes) and includes provisions for implementing tolling specifically to manage congestion. Since the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) was enacted nearly 30 years ago, FHWA has funded more than 136 congestion pricing projects and studies across 21 States and the District of Columbia. These projects were initially funded through the Congestion Pricing Pilot Program and subsequently the VPPP.

Previously funded tolled and nontolled projects have had wide-ranging scopes to including parking and car-sharing studies, priced managed express lanes, and cordon tolling studies. Notably, this program and the ISRRPP are the only methods to convert toll-free interstate highway lanes to tolled lanes if bridge or tunnel reconstruction or replacement is not within the scope. Although the USC states that this program is to provide the authority to toll interstates, FHWA has also used this program to authorize tolling of non-interstate highways.

Although FHWA no longer actively solicits or funds VPPP projects, it retains the ability to grant States the authority to enter into cooperative agreements with the USDOT Secretary to allow studies and tolling under the VPPP. The program is limited to 15 States; however, once a State is in the program, there is no limit to the number of pilots and/or projects the State may pursue and implement as long as they are all approved by FHWA.

Currently nine States and one City are in the program. Six slots are permanently filled by California, Florida, Maryland, Minnesota, Texas, and Virginia, and four are preliminarily filled for tolling studies being conducted by Connecticut, New York City, Oregon, and Nevada. States may be removed from the program and lose their slot if the studies have concluded and no tolling projects requiring permanent status are in operation. States may submit a new expression of interest (EOI), however, and be granted a slot in the program at a later date.

The most recent authorization for the VPPP and the FHWA guidelines provide that:

- The USDOT Secretary shall solicit the participation by Public Authorities in one or more value pricing pilot programs and may enter into cooperative agreements to establish, maintain, and monitor value pricing programs.
- The use of toll revenue is subject to the same oversight as the General Toll Program in 23 USC Section 129: debt service, reasonable return on investment, costs for the improvement and maintenance of the facility, and payments to the private party holding rights to toll revenue under the agreement. If the Public Authority certifies that the facilities are adequately maintained, the authority may use funds for other

USC Title 23 purposes. Toll facilities are required to undergo annual audits to ensure compliance with the limitations on the use of toll revenues.

- The VPPP requires an analysis of the expected effects of the value pricing program on low-income drivers and allows the program to include mitigation measures to address the adverse effects of tolls on low-income drivers.
- Any VPPP project must include, if appropriate, an analysis of the expected effects of the pilot program and may include mitigation measures to deal with any adverse financial effects on low-income drivers.
- The VPPP requires that project sponsors monitor a number of project performance indicators, including the program's effects on driver behavior, traffic volume, transit ridership, air quality, and availability of funding for transportation programs, for at least 10 years and to provide this information in biennial reports to Congress.
- Variable tolling must be used to manage demand.

A Public Authority desiring to toll under the VPPP must have toll-enabling legislation in place and complete and submit an EOI (standard form) to FHWA. The Public Authority should have preliminary studies complete to support the EOI, and consultation with the local FHWA Division Office prior to submittal is recommended. FHWA's Tolling and Pricing Team will review the EOI and determine whether the VPPP is the appropriate program. Upon the Public Authority's submission of the EOI, FHWA may reserve a slot in the VPPP for study before the Public Authority is permanently granted the authorization to toll, though according to FHWA this is not guaranteed.

The Public Authority must then complete its environmental documents and seek federal action. FHWA grants the Public Authority the authority to toll through a cooperative agreement.

7.2.2 Viability of the VPPP in Little Cottonwood Canyon

To toll S.R. 210 in Little Cottonwood Canyon, UDOT would be required to comply with the tolling authorization restrictions and programs in Title 23 of the USC because S.R. 210 has used federal-aid funds in the past. However, S.R. 210 is a viable candidate for authorization to toll under the VPPP for the following reasons:

- The purpose of and need for the S.R. 210 Project include congestion relief.
- Surplus revenues would be used to support alternative transportation modes serving the corridor.
- Tolling has been shown through preliminary studies to be a viable solution.
- Utah has toll-enabling legislation.
- The project is advancing and appears to have the political support needed locally.

The VPPP currently has available capacity to accept the State of Utah into the program. We recommend submitting an EOI soon to secure a spot. This might also benefit the State of Utah by entering the VPPP before any more-restrictive changes are made to the program with future legislation, such as those proposed under the INVEST

in America Act (changes such as additional performance reporting and USDOT Secretary agreements).

7.2.3 INVEST in America Act

The Investing in a New Vision for the Environment and Surface Transportation in America Act (INVEST in America Act) passed by the House of Representatives proposes a few changes to current toll-enabling legislation. Though this Act has only a small chance of advancing in its current form, it is valuable to evaluate the proposed changes since they could represent the long-term intent of the legislators. Below is a summary of the major changes proposed.

- Congestion pricing (VPPP) will be sunsetted and its authorizations moved under 23 USC Section 129, and thus will not limit these types of projects to a pilot program. This also subjects congestion pricing projects to all other requirements of Section 129. New requirements proposed under Section 129 include new performance metrics and reporting, as well as a required agreement with the USDOT Secretary, who has the power to suspend tolls if the facility is not in compliance with performance metrics.
- The INVEST in America Act requires consultation with the local metropolitan planning organization (MPO) and requires that the facility and investments to improve nontolled alternatives must be shown to improve the operation of the corridor or cordon.
- The corridor or cordon must include toll-free facilities adjacent to the toll facility.
- To ensure improvement of the operation of the corridor or cordon, the facility must meet thresholds for performance including operating speeds, that person or freight throughput in the corridor has increased, and that there is a reduction in person hours of delay as determined by the USDOT Secretary.

For more information about the INVEST in America Act, see Section 7.5, INVEST in America Act.

7.3 Best Practices and Approach

Congress's approach to tolling has evolved over the years, and is now seen as an effective tool in expanding mobility through raising revenue and managing congestion. FHWA's implementation of the USC also has evolved and changed based on political and social factors. Through discussions with FHWA and our experience with these programs, we believe that the path to success is in strategically planning and communicating these programs. Our general recommendations for implementing and using these programs are as follows.

- A strong political or politically connected champion is critical to help remove roadblocks, develop consensus among essential stakeholders, and assign the resources to the project.
- Allies and potential opponents must be identified early and a strategic communications plan (focusing on the benefits) developed to engage them.

- Coordination with the FHWA Division Office should occur quickly after the project has been scoped.
- A comprehensive mobility plan incorporating all modes of transportation is needed to support developing agreements with FHWA.
- Clear and demonstrated commitment to use funds in accordance with the program is necessary. If allowed by the program, FHWA strongly favors dedicating funds to expanding transit service as a way to mitigate the impacts of tolling.
- Agencies should explore the use of the 23 USC Section 166 and 129 tolling programs first. FHWA has a clear preference for use of Section 166 and 129 programs, reserving the VPPP as an option for projects that do not fit within those programs. Upon receipt of an EOI in these programs, FHWA will determine whether the program for which the Public Authority indicated interest is appropriate or will recommend an alternative.
- FHWA appears to engage more quickly and positively to projects that have the momentum to become a reality (barring other political or social challenges) as opposed to projects viewed as a planning study.
- The project team must be proactive in order to anticipate the needs of the Public Authority and political leaders, help champion the process, and be extremely responsive to issues raised. Proposals or questions that linger—even for a short time—create confusion and result in delays and stagnation of the project development and implementation phases.
- Keep the program simple. Tolling gets complicated quickly with toll rates, discounts, and other products. Simplifying the message of what it will cost users and how users will benefit from capital spending and/or congestion reduction will garner more support, or at least less opposition.

7.4 Background on Other Tolling Programs

7.4.1 23 USC Section 129 – General Toll Program

The General Toll Program allows tolling new facilities, tolling new capacity, and converting toll-free facilities to tolled facilities under certain conditions. This is considered the primary tolling program by FHWA and the preferred method for tolling federal-aid highways and interstate highways. These opportunities include the following:

- Tolling new highways, bridges, or tunnels added to the system.
- Tolling new capacity added to a non-interstate system highway, bridge, or tunnel, provided the number of toll-free lanes is not reduced.
- Tolling new capacity added to an interstate system highway, bridge, or tunnel, provided the number of toll-free **non-HOV** lanes is not reduced.
- Converting a toll-free Interstate or non-interstate system bridge or tunnel to a tolled facility to pay for reconstructing or replacing the bridge or tunnel (that is, existing and new roadway capacity).

- Converting a toll-free non-interstate highway to a tolled facility to pay for reconstructing the facility (that is, existing and new roadway capacity).

Notably absent from this list is the ability to convert existing toll-free lanes on an interstate highway to tolled lanes if this conversion is not associated with a bridge or tunnel replacement. **The only opportunity to toll existing interstate highway lanes is through the VPPP or ISRRPP.**

Additional requirements of all General Toll Program opportunities affecting the ability to toll include the following:

- The facility must be publicly owned, or privately owned with proper agreements between the Public Authority with jurisdiction over the facility and the private owner.
- The use of toll revenue is limited to debt service, reasonable return on investment, costs for improving and maintaining the facility, and payments to the private party holding rights to toll revenue under the agreement. If the Public Authority certifies that the facilities are adequately maintained, the authority may use funds for other Title 23 purposes.
- The State must have toll-enabling legislation.
- The Public Authority must not enter into a noncompete agreement with a private entity restricting the improvement or adding of capacity to parallel routes to a toll facility.

To implement tolling under 23 USC Section 129, there is no requirement for an agreement between the Public Authority and the USDOT Secretary, or a need to submit an EOI. Instead, the Public Authority should coordinate with its local FHWA Division Office to advance the project. FHWA recommends, but does not require, that Public Authorities execute a Memorandum of Understanding with the FHWA Division Office to describe the approach to meeting the program's requirements. Federal action under the federal National Environmental Policy Act of 1969 (NEPA) is not required unless federal-aid funds are used to plan, design, or construct the additional capacity, rehabilitation, or reconstruction of the facility.

7.4.2 23 USC Section 166 – HOV/HOT Lanes Program

Generally, FHWA encourages the use of HOV lanes to improve the person-carrying capacity of the federal-aid roadway network. If these HOV lanes are operating under capacity, 23 USC Section 166 allows the Public Authority with jurisdiction over the facility to take advantage of the unused capacity by allowing non-qualifying single-occupant vehicles access to the lane by paying a toll (and thereby turning the HOV lanes into HOV/HOT lanes).

There are fewer hurdles to converting an HOV facility to an HOV/HOT facility than implementing other FHWA tolling programs. Section 166 requires that the Public Authority meet the following criteria:

- Demonstrate that the facility is currently operating at acceptable capacity levels and will not become degraded by adding tolled single-occupant vehicles.

- Establish a program to address how motorists can enroll and participate in the toll program.
- Develop, manage, and maintain a system that will automatically collect tolls.
- Establish policies and procedures to manage demand and enforce violations of facility use.
- Ensure that over-the-road buses (public and private buses characterized by an elevated passenger deck located over a baggage compartment) are provided access at the same rates, terms, and conditions as public transportation buses.

The lanes must be variably priced and tolls collected electronically in order to manage travel demand. The local MPO also must be consulted concerning the proposed location of tolling points and rates on the facility. In addition, separate guidelines indicate that the MPO must also endorse the project.

Regardless of whether a toll is charged, the HOV/HOT facility must meet certain performance thresholds including minimum average operating speeds.[5] If the facility operations becomes degraded,[6] the Public Authority must submit to the USDOT Secretary a plan for approval that details actions the Public Authority will take to make progress toward bringing the facility operations into compliance. Annual reporting is required until compliance is achieved.

The use of toll revenue has the same limitations as the General Toll Program in 23 USC Section 129. This includes debt service, reasonable return on investment, costs for the improvement and maintenance of the facility, and payments to the private party holding rights to toll revenue under the agreement. As with Section 129, if the Public Authority certifies that the facilities are adequately maintained, the authority may use funds for other Title 23 purposes, which can include planning and research projects, transportation infrastructure management, engineering, construction, maintenance and traffic operations, right-of-way and environmental expenditures, public transportation, highway safety, and intelligent transportation systems. As with other programs, the use of funds is subject to annual audits.

To implement tolling under Section 166, there is no requirement for an agreement between the Public Authority and the USDOT Secretary, or a need to submit an EOI. Instead, the Public Authority should coordinate with its local FHWA Division Office to advance the project. FHWA recommends, but does not require, that Public Authorities execute a Memorandum of Understanding with the FHWA Division Office that describes their approach to meeting the program requirements. Federal action under NEPA is not required unless federal-aid funds are used to plan, design, or construct the additional capacity, rehabilitation, or reconstruction of the facility.

[5] For HOV/HOT facilities, the minimum operating speed is defined as 45 miles per hour (mph) for facilities with a posted speed limit of 50 mph or greater, and 10 mph below the posted speed limit if the posted speed limit is less than 50 mph.

[6] The facility is considered degraded if the average speed of vehicles is below the minimum operating speeds 90% of the time over a consecutive 180-day period during morning or evening weekday peak-hour periods.

7.4.3 Interstate System Reconstruction and Rehabilitation Pilot Program (ISRRPP)

The ISRRPP allows Public Authorities to toll a federal-aid interstate highways for the purpose of funding needed reconstruction or rehabilitation of the facility. The program is limited to three pilot projects, and to date none have been used successfully. To be eligible for the program, a Public Authority must submit an application including information about the condition of the facility, coordination with the local MPO, an analysis demonstrating that the facility could not be maintained or improved to meet current or future needs using current funding, and a facility management plan.

For the Public Authority to be authorized to toll, the USDOT Secretary must determine from the application that the Public Authority demonstrates or provides:

- An inability to reconstruct or rehabilitate the facility using existing funds,
- A sufficient intensity of need,
- The use, age, or condition of the facility to warrant a toll,
- A plan for implementing a toll that considers stakeholder interests,
- A plan for reconstruction or rehabilitation that is is reasonable,
- Preference given by the State to the use of a public toll authority to build, operate, and maintain the facility, and
- The authority for the project to proceed through legislation and support.

The uses of revenues from the program are limited to debt service, reasonable return on investment, and any costs necessary for the improvement of and the proper operation and maintenance of the toll facility, including reconstruction, resurfacing, restoration, and rehabilitation. Beyond these uses, excess net toll revenue cannot be used for other Title 23 purposes. This is a disadvantage of this program compared to others. Regular audits are required to ensure compliance with revenue use.

The program has some limitations compared to Section 129 in that the USDOT Secretary will determine the program term, potentially limiting the revenue collected in the long term. In addition, federal funds may no longer be used on the toll facility.

A Public Authority wishing to toll under the ISRRPP must complete an application to join the program and demonstrate the financial need, compliance with the program, and applicability of the project for the program as stated above. FHWA will review the application and provide approval contingent on environmental approvals through NEPA. Once federal action under NEPA is complete, FHWA grants the Public Authority the authority to toll through a cooperative agreement.

7.5 INVEST in America Act

The Investing in a New Vision for the Environment and Surface Transportation in America Act (INVEST in America Act) passed by the House of Representatives proposes a few changes to current toll-enabling legislation, which are described in the following sections.

23 USC Section 129

- All Section 129 tolling authority will require agreements with the USDOT Secretary, who has the power to suspend tolls if the facility is noncompliant.
- Tolls must be $0.00 for public and private over-the-road buses.
- The facility's electronic toll collection must be interoperable with other toll facilities in the region.
- Major Federal Action, meaning that provided under NEPA, will be required for all toll projects under Section 129, with specific considerations for congestion impacts, environmental impacts, investments in public transportation, environmental justice and equity impacts, impacts to freight movement, and economic impacts to businesses.
- Use of revenue has been expanded to include any project eligible under Title 23, or Title 49 of Chapter 53 that improves the operation of the corridor or cordon, and for providing discounts or rebates to users.

Congestion Pricing (VPPP)

- Congestion pricing (VPPP) will be sunsetted and its authorizations moved under 23 USC Section 129, and thus will not limit these types of projects to a pilot program. This also subjects congestion pricing projects to all other requirements of Section 129.
- The INVEST in America Act requires consultation with the local MPO and requires that the facility and investments to improve nontolled alternatives must be shown to improve the operation of the corridor or cordon.
- The corridor or cordon must include toll-free facilities adjacent to the toll facility.
- To ensure improvement of the operation of the corridor or cordon, the facility must meet thresholds for performance including operating speeds, that person or freight throughput in the corridor has increased, and that there is a reduction in person hours of delay as determined by the USDOT Secretary.

23 USC Section 166

- Section 166 adjusts and clarifies definitions for public transit vehicles and reducing eligibility for HOV status of alternative fuel vehicles.

ISRRPP

- The ISRRPP will be ended in its entirety.

8 References

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Appendix A. Travel Canyon Profile Expanded

Table 15. Expanded Canyon Travel Profile

	BCC	LCC	Combined
3 Year Average			
Weekend/Holiday	43%	41%	42%
Weekday	57%	59%	58%
Seasonal Distribution			
Fall	**21%**	**20%**	**20%**
AM	36%	40%	38%
MidDay	26%	28%	27%
PM	38%	33%	35%
Weekend/Holiday	44%	45%	45%
Weekday	56%	55%	55%
Spring	**7%**	**8%**	**8%**
AM	31%	50%	42%
MidDay	24%	19%	21%
PM	44%	31%	37%
Weekend/Holiday	45%	38%	41%
Weekday	55%	62%	59%
Summer	**32%**	**25%**	**28%**
AM	33%	38%	36%
MidDay	21%	22%	21%
PM	46%	40%	43%
Weekend/Holiday	43%	40%	41%
Weekday	57%	60%	59%
Winter	**40%**	**47%**	**44%**
AM	61%	65%	63%
MidDay	17%	20%	19%
PM	21%	15%	18%
Weekend/Holiday	42%	40%	41%
Weekday	58%	60%	59%

The times of day are defined as AM (Midnight to 11AM), Mid-Day (11AM – 2PM), PM (3PM to midnight).

Table 16. Forecast Results for Inbound Trips

	Forecast Resulting Inbound Trips					
	BCC			LCC		
	2030	2040	2050	2030	2040	2050
Fall	**253,409**	**293,364**	**339,807**	**261,412**	**282,792**	**305,922**
AM	91,097	105,460	122,156	103,769	112,256	121,437
MidDay	66,242	76,686	88,826	72,411	78,334	84,740
PM	96,070	111,218	128,825	85,232	92,203	99,744
Weekend/Holiday	112,554	130,300	150,928	118,313	127,989	138,457
Weekday	140,855	163,064	188,878	143,099	154,803	167,464
Spring	**83,159**	**96,271**	**111,512**	**108,243**	**117,096**	**126,673**
AM	26,017	30,119	34,887	53,895	58,303	63,072
MidDay	20,372	23,584	27,317	20,547	22,227	24,045
PM	36,771	42,569	49,308	33,801	36,565	39,556
Weekend/Holiday	37,442	43,345	50,207	40,793	44,130	47,739
Weekday	45,718	52,926	61,305	67,450	72,966	78,934
Summer	**383,871**	**444,396**	**514,749**	**324,293**	**350,816**	**379,509**
AM	126,084	145,964	169,072	124,747	134,950	145,987
MidDay	82,137	95,087	110,141	69,782	75,489	81,663
PM	175,650	203,345	235,537	129,764	140,378	151,859
Weekend/Holiday	165,320	191,386	221,685	128,683	139,208	150,593
Weekday	218,551	253,010	293,064	195,610	211,609	228,916
Winter	**483,080**	**559,247**	**647,782**	**623,921**	**674,951**	**730,154**
AM	295,849	342,496	396,717	404,924	438,042	473,869
MidDay	84,246	97,529	112,969	123,013	133,075	143,958
PM	102,984	119,222	138,096	95,984	103,834	112,326
Weekend/Holiday	202,803	234,778	271,947	250,609	271,106	293,279
Weekday	280,277	324,468	375,836	373,312	403,845	436,874
3 Year Total Distri.						
Weekend/Holiday	518,118	599,809	694,766	538,398	582,433	630,069
Weekday	685,401	793,468	919,083	779,471	843,223	912,188

The times of day are defined as AM (Midnight to 11 AM), Mid-Day (11 AM – 2 PM), PM (3 PM to midnight).