1.0 | Project Summary Information

1.1 Project Name (35 letters max) Overhaul 5 FrontRunner Locomotives

1.2 Project Type Transit - Fixed Guideway

1.3 Limits (descriptions should be identifiable. i.e: intersections, place names, landmarks, 35 characters max) FrontRunner corridor

1.4 Project Description (summary of project) Currently UTA’s fleet of locomotives for commuter rail service along the Wasatch Front are rated to EPA’s emission standard of Tier 1. UTA has committed $400,000 per locomotive for overhauls that will bring them to Tier 1+. UTA is requesting MAG funds of $200,000 more per locomotive to upgrade that planned overhaul to Tier 2+ emission levels on five locomotives (effectively the same emission standards as Tier 3). UTA has determined that the useful life of these locomotives is 35 years (till 2043), with engine rebuilds happening approximately every 10 years. (The FTA minimum useful life for a locomotive is 25 years.) Compared to the Tier 1+ upgrade that UTA is committed to this incremental upgrade overhaul will result in additional considerable emission reductions in Utah County. One locomotive running one mile is now equal to 47 single occupant vehicles (SOV) running one mile. With this upgrade, that number is reduced to 34 SOVs traveling one mile. Based on the miles FrontRunner locomotives travel within the county, the upgrade of the 5 locomotives will save 9.13 tons of criteria emissions per year just in the county. That does not include the emissions saved in Salt Lake, Davis and Weber counties which will happen from this upgrade! Wasatch Front Regional Council has already programmed funding for the upgraded overhaul for 6 locomotives, and we are requesting more in their areas this year as well. If this and their requests are approved, all of UTA’s locomotive overhaul upgrades would be fully funded.

1.5 Sponsor (jurisdiction, agency name) Utah Transit Authority

1.6 Contact Information
   Project Manager Fred Engum
   Office Phone 801-287-5416
   Cell Phone 801-243-9185
1.7 Cost Estimate

Total Project Cost (include matches, pledged funds, etc.) $1,000,000
MPO funding request (include any match) $1,000,000 (Includes $67,700 Match)
  PE Cost N/A
  ROW Cost N/A
  Construction Cost N/A
Soft Match proposed for project $2,000,000 This is the value of the basic overhaul that UTA is able to pay for with its own funds.

1.8 Project Rank (rank this project compared to your other submittals)

2

1.9 Air Quality Benefit (summarize CM/AQ Report, NA for non-CM/AQ eligible projects)

Based on the miles FrontRunner locomotives travel within Utah County, the upgrade of the 5 locomotives will save 9.13 tons of criteria pollutant emissions per year. (See attached Emissions Analysis)
2.0 | Project Scope
Always enter “NA” rather than leave an answer blank...

2.1 Describe purpose and need of project.
Provo is an Air Quality Maintenance Area for CO; and the urbanized area of Utah County is a Non-Attainment Area for PM. UTA is required to rebuild the current fleet of locomotives that serve the Wasatch Front to Tier 1+ and this project would provide the opportunity to rebuild 5 locomotive prime mover engines to Tier 2+ emission standards. If the project is not awarded it will be 10 years before the next opportunity to reduce the emissions of these locomotives.

2.2 Describe existing service/conditions
Locomotives are currently an emission standard of 0 or 1

2.3 Highway Project Information (for non-highway projects go to 2.4)

2.3.1 State Route # or Federal Aid Route #
NA

2.3.2 Beginning Mile Post
NA

2.3.3 End Mile Post
NA

2.3.4 Length of project
NA

2.3.5 Existing and proposed number of Travel Lanes
NA

2.3.6 Current and proposed width of facility (detail ROW, lanes, shoulders, ped/planter).
NA

2.3.7 Facility surface type.
NA

2.3.8 Describe how project is consistent with local or agency plans.
NA

2.3.9 Describe how project incorporates ITS needs.
NA

2.3.10 If phased or segmented, describe how the phase has logical termini and what will future phases consist of.
NA
2.3.11 Is project being coordinated with or constructed with a larger project? 
NA 

2.3.12 Describe how project will alleviate congestion on this or other facilities. 
NA 

2.3.13 Describe any traffic improvements. (i.e. lanes, signal coordination, ITS, turn lanes, bus pullouts, etc.) 
NA 

2.3.14 Describe any safety improvements for vehicular and pedestrian traffic. (i.e. raised median, channelization of turn movements, barriers, parkway strips, etc.) 
NA 

2.3.15 How are complete streets addressed with this project? (plan for pedestrians, bikes, transit, trails, ITS) 
NA 

2.3.16 Describe traffic control changes at intersections. (include info to warrant changes) 
NA 

2.3.17 What right-of-way is already secured? 
NA 

2.3.18 What additional right-of-way is needed? 
NA 

2.3.19 Describe utility work to be performed and indicate who will do the work. 
NA 

2.3.20 What type of environmental work will most likely be needed? 
Categorical Exclusion 

2.4 Non-Highway Projects (Transit / ITS / Active Transportation, Park and Ride, etc.) 

2.4.1 Transit Route # 
750 

2.4.2 Length of project 
89 miles for the entire corridor 

2.4.3 What is the expected use of the facility or program? 
Passenger Rail Transportation
2.4.4 What services are provided in the operating of this project?
Rail Passenger Service

2.4.5 Describe any equipment to be purchased (buses, ITS, etc.).
NA

2.4.6 Describe how project is consistent with local or agency plans.
The project intends to reduce commuter rail locomotive emissions to help address air quality issues as referenced in TransPlan40. While utilizing transit as an alternative to driving alone to improve air quality is already a UDOT TravelWise strategy, the project enhances the air quality benefit of mode shift by further reducing locomotive emissions.

2.4.7 Describe how project incorporates ITS needs.
NA

2.4.8 If phased or segmented, describe how the phase has logical termini and what will future phases consist of.
Phasing is possible by reducing the number of locomotives rebuilt, however, if the project is not awarded it will be 10 years before the next opportunity to reduce the emissions of these locomotives.

2.4.9 Is project being coordinated with or constructed with a larger project?
The requested funding for the incremental cost of the overhaul to Tier 2+ is being coordinated with the planned overhaul to Tier 1+ which cost is already committed by UTA.

2.4.10 Describe how project will alleviate congestion on this or other facilities.
The FrontRunner service provides an alternative to SOV trips.

2.4.11 Describe any traffic improvements. (i.e lanes, signal coordination, ITS, turn lanes, bus pullouts, etc.)
The FrontRunner service provides an alternative to SOV trips. Currently ridership in Utah County is an average of 4,957 per day.

2.4.12 Describe any safety improvements for transit and pedestrian traffic. (i.e. raised median, channelization of turn movements, barriers, parkway strips, bridges, etc.)
Riding commuter rail is 20 times safer than driving.

2.4.13 How are complete streets addressed with this project? (plan for pedestrians, bikes, transit, trails, ITS)
NA

2.4.14 What right-of-way is already secured?
NA

2.4.15 What additional right-of-way is needed?
2.4.16 Describe utility work to be performed and indicate who will do the work.
NA

2.4.17 What type of environmental work will most likely be needed?
Categorical Exclusion

2.5 Facility Design

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<thead>
<tr>
<th></th>
<th>Current Conditions</th>
<th>Design Year Click here to enter</th>
<th>Design Year w/o Improvements</th>
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<tbody>
<tr>
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<td>Level of Service</td>
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<td>Functional Class</td>
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<td>Design Speed</td>
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<td>*Accident Rate</td>
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<td>NA</td>
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<tr>
<td>Park and Ride Usage</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
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</tbody>
</table>
3.0 | Project Ranking
The following categories will be used by MPO staff to score each project. The points associated with each category show what total points MPO staff can give. MPO staff’s recommendations will be made available to the MPO TAC Committee for their use in making final project selection recommendations. MPO staff ranking is a tool to aid the MPO TAC Committee in their final selection. The committee is not required to pick projects solely on MPO staff ranks. Please note, if questions pertinent to the project are not answered, zero points will be given.

3.1 Congestion Relief (25 Points)
Explain if the project...

a) Provides an alternate transportation facility that corrects an identified congested problem?
   FrontRunner provides alternative options to SOV trips.

b) Reduces congestion by reducing the number of vehicles.
   FrontRunner reduces the number of vehicles on the road, and this overhaul supports FrontRunner by making it run more efficiently and with fewer emissions from the locomotives.

c) Reduces the need for additional highway lanes for peak hour capacity.
   Commuter Rail is part of the solution to reduce traffic at peak hours.

d) Increases the efficiency of transportation system through traffic management measures.
   Commuter Rail not only reduces traffic congestion but also provides benefits such as: public health; sustainability; mobility and access to the greater transit network.

e) Adds turning movements to relieve a congested intersection.
   Does not add turning movements but Commuter Rail is part of the solution of congestion on our highways and therefore intersections.

3.2 Mode Choice (25 points)
Explain if the project...

a) Benefits multiple transportation systems (transit and highway, pedestrian and transit). Transit use benefits highways by relieving some of the demand on those systems. Pedestrian and bicycle use is also benefited by transit by making those active modes able to travel longer distances than they would be able to with just walking or cycling.

b) Promotes alternative transportation solution to SOV use.
   FrontRunner reduces the number of vehicles on the road, and this overhaul supports FrontRunner by making it run more efficiently and with fewer emissions from the locomotives.

c) Creates or improves linkages between transportation modes.
FrontRunner provides connectivity and options for all active transportation modes, cars, bus, light rail and access for people with disabilities, removing mobility barriers.

d) Reduces physical, psychological, or economic barriers to carpool, bike, walk, or transit use. Rail travel is 20 times safer than driving, provides options to the transportation disadvantaged.

e) Provides incentives to carpool, bike, walk, or transit use. Provides greater connectivity to all modes of transportation and an incentive to those who choose transit as an option to reduce emissions.

3.3 Environmental Quality (15 points)
Explain if the project...

a) Provides cost effective emission reductions (air quality score). The annual Kg of emissions reduced over the project lifetime is 82.84 Kg per $1000 spent.

b) Minimizes environmental impacts or reduces existing impacts (e.g. air/water/noise pollution). The project will reduce NOx, VOC and PM10 for a total of 9.13 tons of emission reduction per year.

c) Enhances the natural, cultural, or historic environment. The locomotive overhauls will significantly reduce emissions thus providing an improvement to our natural environment.

d) Mitigates invasive impacts to existing neighborhoods/commercial areas (minimal relocations). Commuter Rail is part of the solution to reduce traffic congestion and the need for additional roads/highways.

3.4 Safety (20 points)
Explain if the project...

a) Corrects/improves a verified or potential safety or accident problem. Rail transportation is 20 times safer than driving.

b) Improves information/communications for traffic operations and emergency responders. The Commuter Rail UTA network of service, operations, safety and police department provides information to the general public and responds to emergencies by providing options to the public to get to where they need to go in case of emergencies on the highways.

c) Reduces severity of crashes. Commuter rail is directly responsible for reducing SOV travel and therefore removing the chance for crashes on roads.

d) Enhances safe movement of pedestrian, bicycle traffic. UTA address first last mile options by providing safe trails and cycle paths to access commuter rail stations.
e) Provides an intermodal safety improvement (e.g. separation of vehicles-trains, vehicles-pedestrian).
   The Commuter Rail corridor provides separation of vehicles, pedestrians and trains.

3.5 Other Considerations (15 points)
Explain if the project...

a) Effectively distributes funding throughout the MPO area.
   As FrontRunner serves the whole region, this project along with the WFRC who have programmed
   funding for locomotive upgrades will distribute funding throughout the Wasatch Front.

b) Phases project in a manner that the MPO can use limited funds efficiently.
   Phasing is possible by reducing the number of locomotives rebuilt, however, if the project is not
   awarded it will be 10 years before the next opportunity to reduce the emissions of these
   locomotives.

c) Additional funding above required match is pledged toward project (including any soft match).
   UTA is required to overhaul the locomotives to Tier 1+ and have committed $400,000 per
   locomotive. This project will fund the incremental cost of upgrading to Tier 2+

d) Project sponsor ranking of project.
   2

e) Project is numbered project within the current RTP.
   NA
4.0 | Air Quality Report
All projects that are eligible for CM/AQ and CM/AQ-PM2.5 funds must complete this report. These funds are eligible for projects and programs countywide. Contact Susan Hardy at Mountainland AOG if you need help completing 4.4 Quantitative Analysis below, 801/229-3842 or shardy@mountainland.org.

4.1 Eligibility
CM/AQ funds can only be used for projects and programs that a direct benefit to air quality can be demonstrated. Highway expansion, such as new single occupancy vehicle lanes, is not eligible. Turn lanes at congested intersections, transit programs, pedestrian and trail projects, signal modernization, ITS, and IM programs are typical eligible CM/AQ projects.

4.2 CM/AQ Program
The purpose of the CM/AQ program is to fund transportation projects or programs that will contribute to attainment or maintenance of the National Ambient Air Quality Standards (NAAQS) in Ozone (O₃), Carbon monoxide (CO), Particulate Matter – 10 microns (PM₁₀), and PM₂.₅ non-attainment and maintenance areas. The city of Provo is a maintenance area for CO and Utah County is a non-attainment area for PM₁₀ and PM₂.₅.

4.3 Completing this Report
All projects eligible for CM/AQ funds must complete this report. Completing this report can be quite technical, Susan Hardy, Air Quality Coordinator at Mountainland, can help with filling out this report. Contact her at 801/229-3842 or shardy@mountainland.org

4.4 Quantitative Analyses
A quantitative assessment of how a proposed project or program is expected to reduce emissions is important in selecting the most effective use of this fund. List below all travel benefits directly related to this project. Air quality benefit calculations must utilize Mobile 6. The air quality analysis should include assessing emission reductions of transit, traffic flow improvements, ITS projects and programs, ridesharing, bicycle and pedestrian improvements. Complete at least one of the sections below. If quantitative analyses cannot be done, do a qualitative assessment in 4.3.

a) Vehicle Miles Traveled
Number of Vehicle Miles Traveled reduced (VMT): The FrontRunner locomotives in 2016 had an annual VMT of 329,236 in Utah County and the project does not anticipate reducing miles however FrontRunner has a ridership of an average weekday in Utah County alone of 4,957 passenger trips. UTA is committed to reducing SOV trips and FrontRunner is one of the multi-modal solutions that UTA offers.
Average distance of trips reduced: The FrontRunner in Utah County alleviates SOV trips at an average daily rate of 1,051 miles
Emission reduction per average weekday: The project will reduce emissions by 27.25 kg per average weekday.

b) Idling Time
Average idling time per vehicle reduced: NA
Number of vehicles with reduced idling time: NA
Emission reduction per average weekday: NA

C) Vehicle Speed
Average change in vehicle speed (speed before and after): NA
Number of vehicles affected: NA
Emission reduction per average workday: NA

4.5 Qualitative Assessment
Although a quantitative analyses of air quality impacts is required whenever possible, some improvements may not lend themselves to rigorous quantitative analysis, because of the projects characteristics or because practical experience is lacking to adequately analyze the project. In these cases, a qualitative assessment based on a reason and logical examination of how the project or program will decrease emissions and contribute to attainment or maintenance of a NAAQS is appropriate.

Based on the miles FrontRunner locomotives travel within Utah County, the upgrade of the 5 locomotives will save 9.13 tons of criteria emissions per year. (See attached Emissions Analysis)
5.0 | Project Cost Estimate

To develop a project cost estimate, please supply a detailed cost breakdown of your unit costs, inflation, equipment, right-of-way, contingency, etc. To do so, use the Concept Costs Estimate Excel form provided by UDOT (available on Mountainland.org website). Non-construction projects such as equipment purchases, operations, administration programs, studies, etc. can use other methods to show their estimated costs. All sheets or methods used should be submitted as part of the Supplemental Information accompanying the Concept Report.

5.1 Cost Summary

Summarize the information from the Costs Estimate Excel form or other method. Enter NA for items that do not apply to the project.

- a) Preliminary Engineering NA
- b) Environmental Work NA
- c) Construction NA
- d) UDOT Review (project cost <$500k = $5k, >500K = $10k) NA
- e) Construction Engineering NA
- f) Subtotal (in today’s dollars) $1,000,000
- g) Inflated Cost Factor (inflated to 2022) NA
- h) Total 2022 Cost $1,000,000
- i) Non-MPO Funds Available to Project $2,000,000
- j) MPO Funding Request (includes 6.77% local match) $1,000,000

6.0 | Supplemental Information

Please submit any supporting documentation including maps, diagrams, charts, cost estimates, etc. that will allow MPO and UDOT staff and any Technical Advisory Committee to make an informed decision regarding the proposed project. Keep Supplemental Information submittals to 8 pages total.

6.1 Concept Report Submittal

In order to facilitate the distribution of the Concept Reports and any supplemental information, all Concept Reports shall be combined with any supplemental information and saved in PDF format as one document. Please note that this might create a large data file that might be too large to emailed. Plan accordingly to submit your report in electronic format (CD, DVD, Flash Drive) by the required due date. Concept Reports are due by March 29, 2018 at 6pm.

6.2 Contacts, Questions

For help with the Concept Report or questions, please contact:

Bob Allen
801/229-3813
rallen@mountainland.org

Shawn Eliot, AICP
801/229-3841
UTA has committed $400K for each locomotive to upgrade to Tier 1+

Project cost to overhaul to Tier 2+ NOx, CO and PM 10 Savings Per Year 7,450 Kg!
<table>
<thead>
<tr>
<th>kg=1000 grams/kg</th>
<th>1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tons=907200 grams/ton</td>
<td></td>
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<tr>
<td>Frontrunner # for Upgrade</td>
<td>5</td>
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<tr>
<td># Upgraded to Tier 2+</td>
<td>5</td>
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<tr>
<td>Cost to Upgrade to Tier 2+</td>
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<table>
<thead>
<tr>
<th>UTA</th>
<th>Nitrogen Oxides - kg</th>
<th>Hydrocarbons - kg</th>
<th>Carbon Monoxide - kg</th>
<th>Particulate Matter - kg</th>
<th>Total</th>
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<td>24,675</td>
<td>1,313</td>
<td>2,176</td>
<td>1,328</td>
<td>29,492</td>
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<tr>
<td>Tier 1+ Upgrade</td>
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<td>1,070</td>
<td>2,176</td>
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<tr>
<td>Tier 2+ vs Frontrunner</td>
<td>6,418</td>
<td>834</td>
<td>0</td>
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<tr>
<td>Tier 2+ vs Tier 1+</td>
<td>6,418</td>
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<table>
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<th>Emission Reductions</th>
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<td>Tier 1+ (kg/day)</td>
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<td>0.80</td>
<td>0.00</td>
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<td>0.00</td>
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<td>Tier 1+ (tons/year)</td>
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**Annual Kg of Emissions Reduced x Project Lif/ $1,000 Spent**

- Tier 1+ Benefit Kg/$1000: 8.34
- Tier 2+ Benefit Kg/$1000: 82.84
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<thead>
<tr>
<th>UDAQ Locomotive Inventory</th>
<th>UTA 2016</th>
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<tbody>
<tr>
<td>Energy/Fuel Vehicle -Miles</td>
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<tr>
<td>Commuter Rail (Diesel -Gal)</td>
<td>638,358</td>
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<tr>
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<td>329,236</td>
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<th>Nitrogen Oxides</th>
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<tr>
<td>2) Frontrunner Test (grams/gallon)</td>
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<td>12.27</td>
<td>7.49</td>
<td>0.0993</td>
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1) Diesel Locomotive Line - Haul Emission Factors

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<th>Tier</th>
<th>NOx g/bhp-hr</th>
<th>NOx g/gallon</th>
<th>HC g/bhp-hr</th>
<th>HC g/gallon</th>
<th>CO g/bhp-hr</th>
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<th>PM10 g/bhp-hr</th>
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1) Emission Factors for Locomotives, Office of Transportation and Air Quality, EPA-420-F-09-025, April 2009