

## Ecology Grant 2 – Narratives

### **Project Short Description:** 500 words or less

In September 2020, the City of Redmond formally declared a climate emergency and adopted measurable policies through its Environmental Sustainability Action Plan (ESAP), including achieving carbon neutrality from municipal operations by 2030, divesting from fossil fuels, and implementing comprehensive monitoring of municipal energy and carbon impacts. These policies directly align with the goals of the Volkswagen Environmental Mitigation Trust (VW EMT), which prioritizes permanent reductions in nitrogen oxides (NO<sub>x</sub>) and diesel emissions through the replacement of older diesel engines with zero-emission alternatives.

To achieve meaningful emissions reductions, the City identified heavy-duty municipal equipment—particularly fire apparatus—as a priority sector. Fire engines are high-emitting diesel vehicles that operate under frequent load, idle extensively during emergency response and training, and are typically located within residential neighborhoods. Based on EPA and CARB emissions factors, over a conservative 15-year service life, an EV fire engine can displace approximately 270 metric tons of CO<sub>2</sub> and 1.95 metric tons (3,900 pounds) of NO<sub>x</sub>. Replacing a diesel engine with a battery-electric fire engine eliminates these emissions at the point of use, directly advancing VW EMT mitigation objectives.

In October 2021, the Redmond Fire Department adopted a community-driven strategic plan that included explicit environmental sustainability goals and evaluation of alternative fuels for fire apparatus. In November 2022, a team of Redmond firefighters traveled to Madison, Wisconsin, to evaluate the first electric fire engine in active front-line service in North America. The evaluation focused on operational performance, reliability, and firefighter safety, and concluded unanimously that electric fire apparatus could meet or exceed Redmond's emergency response needs while significantly reducing emissions and noise impacts.

Following this evaluation, the City was awarded \$587,154 through the Washington State Department of Ecology Air Quality Volkswagen DERA Grant. In March 2025, Redmond placed the first electric fire engine in service in the State of Washington, demonstrating operational feasibility, trained staffing, and reduced implementation risk.

Building on this proven success, the City seeks funding through the Air Quality Volkswagen Rails, Keels and Wheels Grant to purchase a second NFPA-certified, Type 1 electric fire engine. This project will permanently retire a 2002 diesel fire engine, resulting in estimated lifetime emissions reductions of approximately 1.95 metric tons of

NO<sub>x</sub> and 270 metric tons of CO<sub>2</sub>, while eliminating diesel particulate matter and toxic exhaust exposure.

The electric fire engine will be assigned to Fire Station 11, which serves neighborhoods scoring “8” and “9” on the Washington Environmental Health Disparities Map—areas disproportionately impacted by diesel emissions.

The City of Redmond respectfully requests \$1,500,000 to accelerate diesel displacement, improve air quality in overburdened communities, and advance the intent of the Volkswagen Environmental Mitigation Trust while maintaining the highest standards of emergency response.

### **Project Long Description: 4000 words or less**

In September 2020, the City of Redmond formally declared a climate emergency, recognizing the urgent need to reduce greenhouse gas (GHG) emissions and criteria pollutants that adversely affect public health. Guided by the City’s Environmental Sustainability Action Plan (ESAP), Redmond adopted clear, measurable policies and performance targets, including:

- Achieving carbon neutrality from municipal operations by 2030
- Divesting from fossil fuels
- Implementing a comprehensive system to monitor and report the full carbon and energy footprint of all municipal departments and capital projects

These policies directly align with the intent of the Volkswagen Environmental Mitigation Trust (VW EMT), which prioritizes the reduction of nitrogen oxides (NO<sub>x</sub>) and diesel-related emissions through the replacement or repowering of older diesel engines with zero-emission alternatives.

### **Addressing Diesel Emissions from Heavy-Duty Municipal Equipment**

To achieve meaningful emissions reductions, the City identified heavy-duty municipal equipment—particularly fire apparatus—as a critical sector requiring early action. Fire engines are high-emitting diesel vehicles that operate under frequent load, idle extensively during emergency response and training, and are typically housed within or adjacent to residential neighborhoods.

Based on EPA and CARB heavy-duty diesel emissions factors, a single aging diesel fire engine emits approximately:

- 18 metric tons of carbon dioxide (CO<sub>2</sub>) annually
- 0.13 metric tons (260 pounds) of nitrogen oxides (NO<sub>x</sub>) annually

- Measurable particulate matter (PM<sub>2.5</sub>) and diesel exhaust toxics associated with adverse respiratory and cardiovascular outcomes

Over a conservative 15-year service life, one diesel fire engine can be expected to emit:

- ≈270 metric tons of CO<sub>2</sub>
- ≈1.95 metric tons (3,900 pounds) of NO<sub>x</sub>

Replacing a diesel fire engine with an electric fire engine helps eliminate these emissions at the point of use, directly fulfilling VW EMT objectives related to NO<sub>x</sub> reduction, diesel displacement, and public-health benefit.

### **Fire Department Strategic Planning and Early Adoption of Zero-Emission Technology**

In October 2021, the Redmond Fire Department adopted a community-driven strategic plan that included explicit environmental sustainability objectives, including the evaluation and adoption of alternative fuels for fire apparatus. This effort was informed by community input, City climate goals, and emerging national best practices within the fire service.

Recognizing the limited real-world data available on electric fire engines at the time, the Department made a deliberate investment in first-hand evaluation. In November 2022, a team of Redmond firefighters traveled to Madison, Wisconsin, to assess the first and only electric fire engine in active front-line service in North America. The evaluation focused on emergency response performance, reliability, operational readiness, and firefighter safety.

The evaluation team reported unanimous agreement that electric fire apparatus could meet or exceed the operational requirements of the Redmond Fire Department while significantly reducing emissions and noise impacts in the community.

### **Proven Implementation and Demonstrated Readiness**

Following this evaluation, the City of Redmond applied for and was awarded \$587,154 through the Washington State Department of Ecology Air Quality Volkswagen DERA Grant in November 2022. In March 2025, the City successfully placed the first electric fire engine in service in the State of Washington, demonstrating operational feasibility and institutional readiness.

This deployment represents a verified, real-world displacement of a diesel fire engine and its associated emissions. It also provides the City with direct operational experience, trained personnel, maintenance protocols, and charging infrastructure—substantially reducing implementation risk for subsequent electric apparatus.

## **Proposed Project: Second Electric Fire Engine Acquisition**

Building on this demonstrated success, the City of Redmond is now seeking funding through the Air Quality Volkswagen Rails, Keels and Wheels Grant to procure a second NFPA-certified, Type 1 electric fire engine.

The proposed project will result in the permanent retirement of a 2002 diesel fire engine, producing immediate and long-term reductions in NO<sub>x</sub>, CO<sub>2</sub>, and diesel particulate emissions.

Estimated lifetime emissions reductions for this single EV engine replacement in lieu of a traditional diesel engine include:

- ≈1.95 metric tons of NO<sub>x</sub> avoided
- ≈270 metric tons of CO<sub>2</sub> avoided
- Elimination of diesel particulate matter (PM<sub>2.5</sub>) and toxic exhaust exposure at emergency scenes, fire stations, and surrounding neighborhoods

These reductions are directly attributable to the project and align squarely with VW EMT mitigation priorities.

## **Delivery Timeline and Grant Compliance**

The City of Redmond can meet all grant requirements except the delivery deadline of October 31, 2027. At present, no manufacturer of electric fire engines can guarantee delivery in less than approximately 26 months from the date of order, due to limited manufacturing capacity and specialized component supply chains. Redmond's first electric fire engine was delivered in 23 months, demonstrating efficient procurement and project management within the limitations of the manufacturing industry.

However, if awarded, the City believes it can deploy the electric fire engine within 28 months of grant approval, ensuring rapid realization of emissions-reduction benefits.

## **Deployment in Disproportionately Impacted Communities**

The new electric fire engine will be assigned to Redmond Fire Department Station 11 (8450 161st Ave NE, Redmond). This station is currently undergoing installation of multiple DC fast-charging units, ensuring charging capacity is fully operational prior to apparatus delivery.

Station 11 serves neighborhoods that score "8" and "9" on the Washington Environmental Health Disparities Map, identifying them among the areas most adversely impacted by diesel exhaust and cumulative environmental health burdens. Deployment of a zero-emission fire engine at this location directly advances

environmental justice objectives by reducing diesel emissions in communities that experience disproportionate exposure.

### **Public Outreach, Education, and Transparency**

The City of Redmond is committed to broad public outreach and transparent reporting on the outcomes of this grant. The City's Communications Division—a six-person team reporting directly to the mayor—will integrate the project into existing outreach platforms, reaching a daytime population of 130,523 and an evening population of 73,256 through:

- Digital email newsletters (68,000 subscribers)
- Social media (73,000 total followers across City accounts)
- Redmond.gov (≈2,100 daily visitors)
- RCTV cable television station and video programming
- Media releases and earned media coverage
- *Focus* print newsletter (34,000 residents and businesses, three times annually)
- Citywide posters, brochures, and educational materials
- Unit showcased at regional climate impact meetings/events

Outreach related to Redmond's first electric fire engine generated strong local and regional support, including engagement from:

- State and federal legislators
- Seattle & King County Public Health and EMS leadership
- Kiwanis Club of Redmond
- Amazon
- Microsoft

This project will continue to serve as a visible demonstration of how VW EMT funds produce tangible, community-level air-quality improvements.

### **Conclusion and Funding Request**

The Redmond Fire Department has made a sustained and strategic investment in transitioning to a zero-emission fire apparatus fleet. Grant funding will accelerate this transition by offsetting the higher upfront cost of early-market electric fire engines while delivering measurable NO<sub>x</sub> and diesel emissions reductions consistent with the Volkswagen Environmental Mitigation Trust.

Accordingly, the City of Redmond respectfully requests \$1,500,000 in grant funding to purchase an NFPA-certified, Type 1 electric fire engine, achieving permanent diesel displacement, improving air quality in disproportionately impacted communities, and maintaining the highest standards of emergency response capability.

Notes:

Unit 8017 – 2002 Pierce      VIN: 4P1CT02S92A002113

Fuel – 754 gals per year

Address: 8450 161<sup>st</sup>. AVE. NE Redmond, WA 98052

Narratives as submitted on the website:

City of Redmond requests \$1,500,000 in grant funding to purchase an NFPA-certified, Type 1 electric fire engine

In September 2020, the City of Redmond formally declared a climate emergency and adopted measurable policies through its Environmental Sustainability Action Plan (ESAP), including achieving carbon neutrality from municipal operations by 2030, divesting from fossil fuels, and implementing comprehensive monitoring of municipal energy and carbon impacts. These policies directly align with the goals of the Volkswagen Environmental Mitigation Trust (VW EMT), which prioritizes permanent reductions in nitrogen oxides (NO<sub>x</sub>) and diesel emissions through the replacement of older diesel engines with zero-emission alternatives.

To achieve meaningful emissions reductions, the City identified heavy-duty municipal equipment—particularly fire apparatus—as a priority sector. Fire engines are high-emitting diesel vehicles that operate under frequent load, idle extensively during emergency response and training, and are typically located within residential neighborhoods. Based on EPA and CARB emissions factors, over a conservative 15-year service life, an EV fire engine can displace approximately 270 metric tons of CO<sub>2</sub> and 1.95 metric tons (3,900 pounds) of NO<sub>x</sub>. Replacing a diesel engine with a battery-

electric fire engine eliminates these emissions at the point of use, directly advancing VW EMT mitigation objectives.

In October 2021, the Redmond Fire Department adopted a community-driven strategic plan that included explicit environmental sustainability goals and evaluation of alternative fuels for fire apparatus. In November 2022, a team of Redmond firefighters traveled to Madison, Wisconsin, to evaluate the first electric fire engine in active front-line service in North America. The evaluation focused on operational performance, reliability, and firefighter safety, and concluded unanimously that electric fire apparatus could meet or exceed Redmond's emergency response needs while significantly reducing emissions and noise impacts.

Following this evaluation, the City was awarded \$587,154 through the Washington State Department of Ecology Air Quality Volkswagen DERA Grant. In March 2025, Redmond placed the first electric fire engine in service in the State of Washington, demonstrating operational feasibility, trained staffing, and reduced implementation risk.

Building on this proven success, the City seeks funding through the Air Quality Volkswagen Rails, Keels and Wheels Grant to purchase a second NFPA-certified, Type 1 electric fire engine. This project will permanently retire a 2002 diesel fire engine, resulting in estimated lifetime emissions reductions of approximately 1.95 metric tons of NO<sub>x</sub> and 270 metric tons of CO<sub>2</sub>, while eliminating diesel particulate matter and toxic exhaust exposure.

The electric fire engine will be assigned to Fire Station 11, which serves neighborhoods scoring "8" and "9" on the Washington Environmental Health Disparities Map—areas disproportionately impacted by diesel emissions. Fire Station 11 is currently being upgraded with DC Fast Charging capabilities, a project approved in 2024, so no funding will be needed for infrastructure.

The City has a robust community engagement plan that is based in part on the success of the first EV fire engine outreach plan.

The City of Redmond respectfully requests \$1,500,000 to offset the \$2,423,050 cost of a new EV fire engine, and to accelerate diesel displacement, improve air quality in overburdened communities, and advance the intent of the Volkswagen Environmental Mitigation Trust while maintaining the highest standards of emergency response.

The City of Redmond can meet all grant requirements by the deadline of October 31, 2027.