



State of Wyoming Department of Transportation

Zero Emission Vehicle Infrastructure Strategic Plan

Request for Information (RFI): 22-011CS

December 1, 2021

Submitted By:

Deloitte Consulting, LLP | 1601 Wewatta Street, Ste 400 | Denver, CO 80202

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1601 Wewatta Street, Ste 400
Denver, CO 80202

Submitted To:

Cori Schrinar
Procurement Services Manager

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Deloitte Consulting, LLP
1601 Wewatta Street
Denver, CO 80202
Tel: +1 (720) 988-5297
www.deloitte.com

December 1, 2021

Cori Schrinar
Department of Transportation, Procurement Services Office
5300 Bishop Blvd, Building 6189
Cheyenne, WY 82009

RE: Request for Information (RFI): 22-011CS, Zero Emission Vehicle Infrastructure Strategic Plan

Dear Ms. Schrinar:

Deloitte Consulting LLP is pleased to provide the Wyoming Department of Transportation (WYDOT) with our response to the Request for Information (RFI) # 22-011CS for a Zero Emission Vehicle Infrastructure Strategic Plan.

We welcome the opportunity to meet with WYDOT to expand upon our insights, provide input for your procurement efforts, and advance your vision. Please contact me at 720-988-5297 or mkay@deloitte.com with any questions or to discuss our approach in more detail. Thank you for considering Deloitte's input and we look forward to further conversations.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Kay".

Deloitte Consulting, LLP

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1. Introduction

Deloitte Consulting LLP (Deloitte) is pleased to share our expertise, past experiences, and recommendations to support Wyoming's Department of Transportation (WYDOT) in providing insights to support the requirement for a **Zero Emission Vehicle (ZEV) Infrastructure Strategic Plan**. Our approach leverages Deloitte's breadth of infrastructure and electric vehicle supply equipment (EVSE) capabilities, and first-hand experience conducting infrastructure assessments for large government organizations.

Point of Contact Information: Mark Kay, (720) 988-5297, mkay@deloitte.com

Business Information: Deloitte Consulting LLP, 1601 Wewatta Street, Ste 400, Denver, CO 80202, (720) 988-5297

1.1 Deloitte Consulting

Deloitte is a full-service professional services organization providing consulting, financial advisory, tax, and audit services under a unified Deloitte brand. We have market-leading industry knowledge, business-transformation capabilities, and deep technical expertise to create market offerings that turn challenges into opportunities. As the largest provider of professional services in the US, Deloitte brings its nationally-connected network, world-class capabilities, and deep local knowledge to help clients succeed wherever they operate.

We are actively engaged across the mobility ecosystem, working with a wide variety of organizations—including transportation; energy and power; automotive; tech; insurance; financial services; federal, state, and local government agencies; and beyond—to help clients define where and how they can thrive in the new mobility market. Deloitte has decades of experience advising clients not only on the most pressing issues within the energy and transport sectors, but also current experience where these sectors meet: transportation electrification. Our expertise includes providing analytics and modeling tools for forecasting and scenario planning, understanding evolving consumer preferences for mobility solutions, and designing and implementing new business and operating models. We work with the public sector to devise mobility plans that take advantage of emerging technologies, enabling new public-private partnerships (P3) and integrating infrastructure strategies with transportation policy and programs. We bring the breadth of Deloitte's services and solutions, as well as our deep cross-sector mobility insights to help our clients position themselves for sustainable success as new mobility and transportation electrification ecosystems emerge.

1.2 Relevant Infrastructure Capabilities

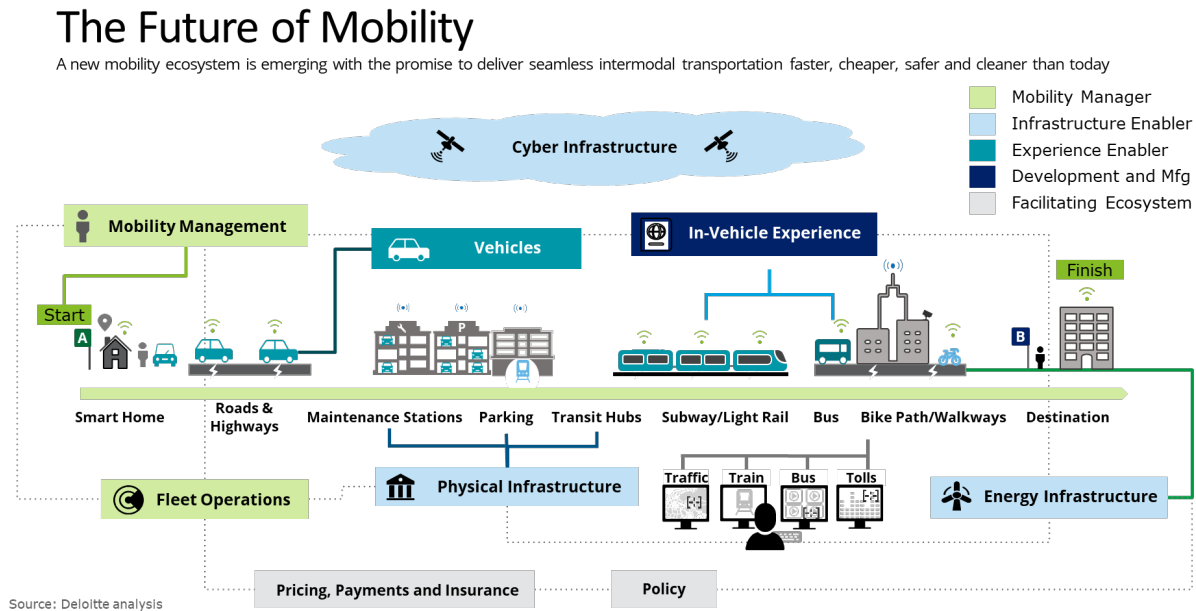
Our global talent base and capabilities include our Infrastructure & Capital Projects (I&CP) Practice with over 4,500 professionals and our Transportation Sector with over 1,500 professionals. In the US and Canada alone, we have over 300 I&CP professionals serving the public and private sectors. Our I&CP Practice and Transportation Sector professionals are complemented by a global network of experts in related areas of infrastructure and smart cities. Deloitte's technical experience in cities includes strategic planning, institutional design and transformation, infrastructure finance, sell-side transaction by public sector entities, P3, land-value capture, and advising international financial institutions on city-level opportunities. Our team has developed AI-powered tools and accelerators, such as M.Charge and InfraSights, to help government agencies and stakeholder groups to plan for ZEV infrastructure.

Deloitte's Future of Mobility (FoM) practice works closely with the private sector, governments, civic leaders, unions, non-governmental organizations (NGOs), technologists and universities globally to shape the future of mobility ecosystem. We help them understand the disruption underway, imagine the future and "art of the possible" to shape strategy, design future solutions,

adapt policy, restructure operating and business models, and adopt new technologies to transform how their communities and organizations can succeed in the new mobility ecosystem.

Deloitte has been engaged in several projects to address some of the nation’s mobility and transit problems. Performing services ranging from fare collection improvement to electric vehicle charging and strategy, Deloitte has a portfolio of experience as shown in Figure 1:

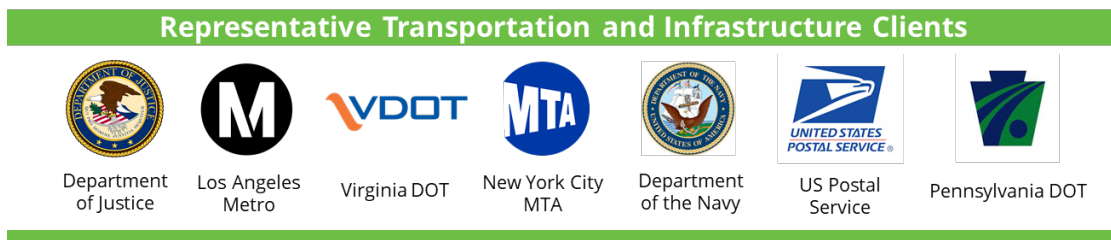
Figure 1: Thought Leadership in Mobility



Our FoM practice has developed advanced thinking around how cities could establish a Mobility Operating System (mOS). As the populations of cities continue to grow, we are not going to be able to build more infrastructure (e.g., new roads, new subway lines, new train tracks) or modernize existing transportation systems (e.g., light rail, subways) fast enough to keep up. All of the innovation in mobility (e.g., self-driving cars, dynamic shuttle buses, ride hailing, micro-mobility) adds incrementally to the supply side and is exacerbating congestion. With the application of big data and analytics, we can begin to shape, mold, and nudge citizens’ transportation choices towards those that are more sustainable, cheaper, and faster.

As we advance seamless integrated intermodal transportation where people want to go from Point A to Point B using different modes and can pay one price for the entire journey, there is a need to create a digital platform that provides visibility into the supply and demand side so city officials and private stakeholders can achieve a more efficient equilibrium between supply and demand. The mOS enables cities and states to adopt variable and dynamic pricing for congestion, carbon impact, and use of the infrastructure, to provide new sources of revenue to offset lower parking fees, gas taxes, and sales taxes, among others.

Figure 2: Deloitte’s Representative Transportation and Infrastructure Clients



An additional differentiator of our fleet practice is our ability to draw expertise from our broader FoM and transportation practice which has a history of delivering transformational projects at scale for government agencies and numerous commercial entities. Deloitte counts among its clients **89% of the Fortune Global 500 transportation companies, and 85% of the Fortune Global 500 automotive companies**. Our strategic relationships with fleet technology vendors and commercial partners allow us to leverage the most cutting-edge fleet solutions and insights for our government and public sector clients.

Further, we also serve **96% of the Fortune 1000 power/utility companies** and have helped our utility clients across the country address many of the challenges that Wyoming will face as it designs and rolls out its ZEV infrastructure plan. For example, Deloitte advisors have helped utilities understand current and anticipated EVSE technology trends and capabilities, business models, grid impacts, and regulatory frameworks.

2. Technical Response

WYDOT requires contractor support to inform a holistic plan for enabling ZEV infrastructure development and planning while reducing the costs of ZEV services. WYDOT will need to take an approach that views numerous transportation and infrastructure considerations (such as infrastructure placement and incentivization) as an interconnected part of overall transportation management within the State. Deloitte can partner with WYDOT to develop an approach for understanding and prioritizing ZEV infrastructure investments to meet WYDOT's ZEV goals. To encourage drivers to switch from gas-powered vehicles to ZEVs, a strategic approach to ZEV infrastructure rollout will allow WYDOT to advance in-state and out-of-state ZEV usage, incentivize growth, and bring economic benefit to the state.

Below are Deloitte's responses to the questions posed in the RFI:

2.1 Infrastructure Installation, Placement, and Operation

Advanced planning for ZEV adoption can greatly benefit Wyoming's residents and businesses, state and local employees, public transportation, and other stakeholders by reducing costs for ZEV ownership and services. The location of charging stations is critical to any strategy to optimize corridor and community charging, manage energy and grid impacts, and ensure accessibility in advance of ZEV expansion across Wyoming. Once in operation, infrastructure networks need to operate reliably to generate public trust/confidence.

2.1.1 Infrastructure Planning and Placement

WYDOT should consider both the economic viability and projected demand growth of direct current fast charging (DCFC) and hydrogen fueling for vehicles. However, with electric vehicles (EVs) dominating the automotive market in relation to hydrogen fuel cell vehicles, WYDOT should focus initially on DCFC and Level 2 (240 volt) electric vehicle supply equipment (EVSE).

Corridor Development

DCFC stations should be concentrated primarily along US DOT's pending EV corridors along I-80, I-25, and I-90. Funding corridor development helps statewide infrastructure emplacement for several reasons:

- EVSE transaction sales tax can serve as a mechanism for capturing road usage fees from out-of-state EV drivers, who will comprise a significant base of interstate corridor EVSE users and generate revenue that can be applied to fund further EVSE expansion.
- Corridor EVSE will encourage local EV adoption and serve EV owners who do not have access to residential charging.

- Highly visible public charging stations and signage along highway corridors (e.g., truck stops, rest stops, fast food restaurants) will bring EV traffic and associated traveler revenue to the communities along the corridor.

A fragmented EVSE rollout could lead to poor driver experiences and low operator profitability that would hinder further development. WYDOT should carefully map and plan an approach with identified key stakeholders when undertaking corridor investments. Effective partnerships with public and private entities will allow WYDOT better perspective for a strategic corridor plan. Not all routes are equally suited for EV rollout.

WYDOT should carefully consider technology and infrastructure requirements to develop a phased rollout approach that will allow it to meet targets. **WYDOT may want to assess anticipated future EVSE demand to determine a rollout approach that maximizes revenue and enhances network reliability**, for both corridor and non-corridor development. For example, WYDOT could choose to focus initial EVSE investments on Wyoming’s EV corridor entry points from neighboring states with high EV users (such as I-80 near the Utah border or I-25 near the Colorado border).

Deloitte developed an AI-powered and cloud-native big data platform, M.Charge, to help planners better understand the implications of siting EVSE in their service areas. Using data such as EV customer adoption rates, travel patterns, and demographics, M.Charge can forecast unmet EV charging demand, model EV charging revenue, and recommend dynamic pricing. M.Charge sample data layers are shown in Figure 3 and key features are shown in Figure 4.

Figure 3. M.Charge Sample Data Layers

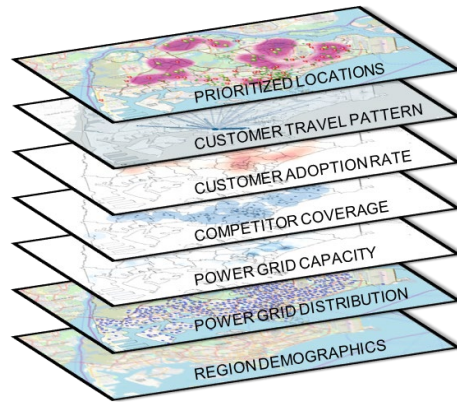


Figure 3. M.Charge Key Features

DEMAND ESTIMATION	INFRASTRUCTURE PLANNING	IMPACT SIMULATION
<ul style="list-style-type: none"> • EV charging demand estimation based on multi-parameter local adoption modelling • Competing local charging service provider coverage estimation • Property prioritization through unmet EV charging demand prediction 	<ul style="list-style-type: none"> • Location charging capability estimation based on power grid analytics • Charging point specification and distribution rollout planning to maximize utilization • Dynamic pricing based on long term historical utilization data 	<ul style="list-style-type: none"> • Charging point utilization estimation based on EV user travel patterns • EV charging revenue modelling conditioned on long term demand forecasting • Mid- and long-term greenhouse gas emission reduction estimation

Non-Corridor EVSE Development

Outside of corridor development, WYDOT will need to identify concentrated population areas with high levels of traffic and high projected EV charging demand. WYDOT will need to consider

existing buildings and lands by type and ownership (e.g., residential, commercial, government), zoning permits and restrictions, and locations of high use vehicle areas such as highways and public areas (e.g., shopping malls, tourist destinations, rest stops).

WYDOT should also consider factors such as seasonality of traffic flow, EV registrations and adoption rates by zip code, and household income levels by zip code. EVSE should reach all communities where there is potential demand. WYDOT's rollout strategy should include provisions for equitable and affordable EVSE access for rural, low-income, and historically disadvantaged communities. When addressing urban, rural, and EVSE equity concerns, local community groups should be engaged to identify opportunities to fill local EVSE gaps. Wyoming should also look beyond personal vehicle charging to buses and trucks. For example, electrifying commercial fleets in industrial areas may be beneficial to communities.

A robust EVSE rollout plan can have positive impacts on the surrounding communities. Deloitte's FutureScape™ tool uses big data and scenario analysis to inform planners of the impacts, benefits, and costs of various rollout options. The FutureScape simulation platform creates digital replicas of large systems like state transit networks to run scenarios and generate insights on the impacts of unplanned events or new business models. This **large-scale digital twin can help WYDOT to understand long-term or potentially unforeseen impacts** of various EVSE strategies and scenarios, incorporating related infrastructure like the electrical grid and roadway traffic patterns.

2.1.2 Infrastructure Installation

The REV WEST Voluntary Minimum Station Standards state that stations should be located within 0.5 miles from a highway interchange or exit to maximize driver convenience and accessibility. These standards are informative for infrastructure planning, particularly for consistency across REV West. While REV West is useful at a macro-level, WYDOT should consider perspectives from local stakeholders such as municipalities, distribution utilities, relevant associations, and private sector (e.g., EVSE providers, fleet owners) when developing long-term plans.

Additionally, **corridor-based infrastructure should be sized for future EVSE upgrades**. While present day EV owners may not require a high maximum power rating (e.g., 50 kW), a higher rating (e.g., 350 kW) will be advantageous as vehicle battery sizes increase. WYDOT may also wish to limit the duration of EVSE use (e.g., maximum 3 hours per EV charging user) to allow for greater numbers of EV users to be charged.

2.1.3 EVSE Operation

WYDOT should stipulate that **any publicly-funded EVSE should be constructed to meet applicable codes and regulations, and adhere to operational standards for maintenance, accessibility, and interoperability over its lifecycle**. Deloitte can assist WYDOT in convening stakeholders, developing requirements, mitigating risk, and establishing a governance architecture to help WYDOT negotiate terms for successful partnerships and program.

Revenue Collection and Program Oversight

Revenue may be collected from EV charging station users through a method known as charging as a service (CAAS). The charging station owner and operator installs a machine that requires payment prior to unlocking the charger or turning on power to charge an EV. This is a useful mechanism for public locations such as rest areas, shopping centers, restaurants, entertainment facilities, national parks, recreational centers, apartment buildings, and condominiums. **The State of Wyoming can receive revenue from EV charging station services through a sales tax, which could then be used to support EVSE development across the state.**

P3 models, while common in traditional infrastructure, are relatively new for EVSE, and will require multifaceted coordination across utility and transportation. Deloitte has extensive experience supporting revenue collections systems and management across federal, state, and local agencies. We are exceptionally qualified to provide Wyoming with financial advisory services, along with innovation capabilities for both traditional and alternative delivery P3 requirements.

WYDOT should have access to charging data for publicly funded stations, to track usage patterns and key performance indicators on the efficacy of EVSE placement. Aggregated data should inform future program decision-making and investment for policymakers, utility partners, and EVSE operators.

Interoperability and Standards

WYDOT should be supportive of interoperability across the EVSE value chain because it results in lower end-user costs and higher adoption rates. Consumers should have confidence that stations will be accessible and convenient to operate, including enabling unrestricted payment via credit card and use without subscription. EV charging service providers should be encouraged to enable universal EV roaming via Open Charge Point Interface (OCPI) in the same way that ATMs operate across banking networks.

Deloitte does not currently conduct EVSE installation, but we are aware and familiar with tentative code on EVSE in NIST Handbook 44, Section 3.40, for commercial sale of electricity as vehicle fuel. Deloitte understands that the goal of the tentative code is to provide accuracy and transparency for public EVSE transactions. If not already adopted, most states will soon adopt and subsequently enforce provisions of the code for dispensing electricity as a fuel.

WYDOT will need to ensure that interoperability requirements are present in EVSE procurement such that any grant funding go to vendors that adhere to relevant standards. Our breadth of relationships enables us to scrutinize our ecosystem of partnerships to only include charging equipment manufacturers and developers who maintain a direct focus on compliance with all requirements and regulations (both established and tentative), such as NIST Handbook 44, National Electric Code (NEC) 625, Society of Automotive Engineers (SAE) J1772, and International Organization for Standardization (ISO) 15118.

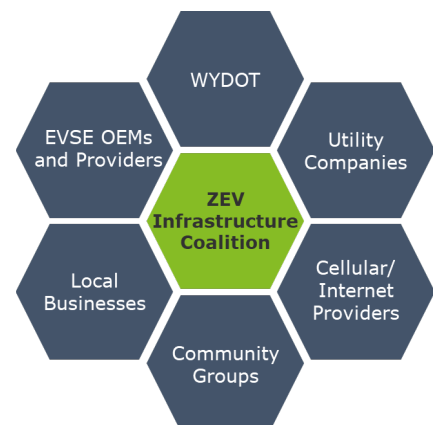
2.2 Utilities

Utilities are an important stakeholder in the electrification process. WYDOT should **work with utilities to make sure grid development plans are aligned with the timing and rollout of WYDOT’s EVSE corridor**. For example, stations or groupings of stations with high anticipated demand may require utility investment (for example a new substation for a large EV fleet) to support reliability. Utilities commonly offer rebates or on-bill credits for EVSE procurement at personal residences, multifamily housing, commercial retail businesses, and employee workplace charging. Utilities can also support development of public DCFC or own and operate the stations themselves.

Deloitte has a robust transportation and utility practice and can work with WYDOT to navigate a collaborative approach considering the objectives of both stakeholders to support a reliable EV corridor program.

Utilities assess demand charges to smooth charging demand over the course of the day. These charges can be a

Figure 5: Representative ZEV Infrastructure Coalition



significant disincentive for DCFC station installation, reducing the potential profitability of the stations. WYDOT should **consider engaging with electricity regulators to advocate for rate designs that reduce demand charges for public fast chargers** to encourage commercial charging stations. A siting strategy that targets high-volume areas to increase viability of the stations.

Deloitte notes that WYDOT will likely require internet availability at charging station sites in order to be able to track and manage usage and other data. Different types of network and communications platforms carry implications for upfront, ongoing operations and maintenance costs. Deloitte’s team can help WYDOT evaluate a broadening range of options from EVSE providers through leading procurement practices.

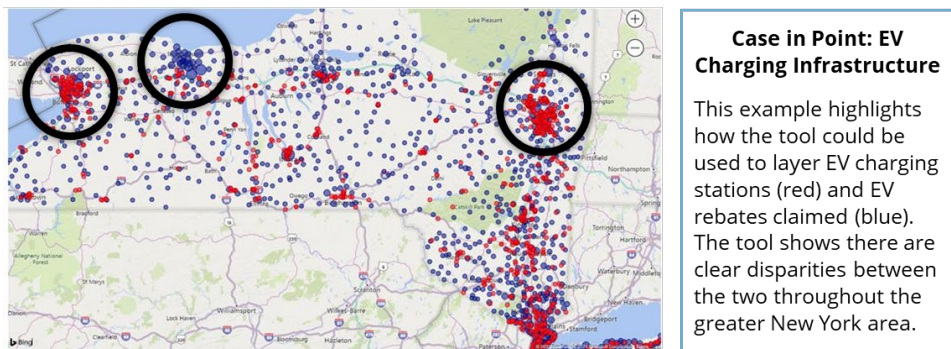
2.3 Statutory and Policy Considerations

2.3.1 Land Use

State lands should be considered for infrastructure emplacement as an opportunity to generate additional revenue from both in-state and out-of-state consumers. Deloitte is well positioned to support this given its development of InfraSights, a clean energy infrastructure illumination and portfolio management system, which aggregates data to help policymakers and utility and technology partners with investment decisions. It is a real-time big data analytic platform that provides layers of data for

infrastructure, including electric vehicle charging stations, optimizing locations of where to install charging stations, by when, and how far apart from other charging station locations.

Figure 6. InfraSights Use Case Example



Land use and availability is a high priority concern for infrastructure development. Bearing zoning permit restrictions and residential areas in mind, Wyoming should have long-term land use plans which are critical for infrastructure. Accurate land use, land ownership, and land availability data and information is vital for the government to collaborate with businesses and residential areas. The State of Wyoming should **allocate state and local government owned and used lands equitably and appropriately for EVSE.**

Should Wyoming implement electrification of its fleet and public transportation, the State could also then justifiably install charging stations in all of its parking lots. Wyoming should also consider building charging stations at its state parks, so as to encourage EV usage and allay any fears of EVs being stranded at state parks. This would be especially beneficial to out-of-state visitors who travel to Wyoming state parks using EVs, and it would provide the state with the opportunity to generate additional revenue from out-of-state visitors.

2.3.2 Rebates and Incentives

EVSE implementation is a costly endeavor and WYDOT will need a strategic plan that addresses this with alternative financing options such as P3 models with grant funding in order to close the cost gap. For example, Yellowstone-Teton Clean Cities (YTCC) offers \$5,000 rebates toward the purchase of publicly accessible charging infrastructure. Programs such as this support business growth and entrepreneurship by assisting to reduce steep upfront costs

for infrastructure development projects. YTCC rebates are offered in Wyoming, but are limited to available funds, and are approved on a first-come, first-served basis. WYDOT could **explore additional options for implementing infrastructure rebates and business license fee rebates** to create financial-assistance opportunities for private companies who wish to develop publicly accessible charging infrastructure.

Furthermore, WYDOT could **encourage changes to building codes, zoning ordinances, and permitting requirements to encourage EVSE development** for new construction (make EV-capable). Establishing clear design criteria for EVSE will smooth the permitting process.

Overall, commercial fleets will view total cost as their primary concern for both vehicle ownership and return on investment when pertaining to transitioning to an electric fleet. The upfront cost of EVSE projects can also be an additional deterrent to commercial fleet conversions. State financial incentives for vehicles and EVSE can help offset fears of steep initial investment costs, and significantly tip the balance in favor of EV adoption.

2.3.3 Statutes, Laws and Carbon Policy Considerations

Gas tax revenue is declining as the domestic vehicle fleet fuel economy continues to rise. User-based alternative revenue mechanisms like road user charges (RUCs), such as the mechanism currently being piloted by WYDOT, are a fair approach to garner road maintenance taxation from zero emission vehicles. Applying mileage-based fees as opposed to EV fees is widely viewed as the preferable method because they are based on usage and, like the gas tax, are not applied uniformly for low and high mileage drivers.

Many relevant studies show that electric vehicles produce overall lower emissions (including those created through electricity generation) than combustion engine vehicles, which suggests that a large-scale conversion from combustion engine vehicles to electric vehicles will be beneficial toward carbon policy and combating climate change. Any incentives created by the state to encourage electric vehicle usage will be beneficial to both the EV/EVSE market and carbon policy/climate change efforts.

In addition, vehicle-to-grid (V2G) technology allows for electric vehicles while connected to infrastructure to provide power back to the grid during peak demand hours, crediting the vehicle owner for the power provided back from the vehicle. Once implemented on a larger scale, V2G technology has tremendous potential to reduce the overall emissions created by grid utility companies in the process of generating electricity for large surges during peak demand.

WYDOT should weigh EV/EVSE statutes and laws based on potential benefits (revenue) against costs (lower EV adoption). Wyoming could assess whether existing laws and statutes (such as alternative fuel licensing fee [Wyoming Statute 39-17-306] and alternative fuels tax [Wyoming Code Title 39, Chapter 17, Article 3]) could be adjusted to capture revenue without disincentivizing EVSE development.

2.4 Incentives

Corridor and local travel stations are different use cases (DCFC vs. Level 2). Incentives for corridor and local networks will need to hit different markets. Incentives for corridor development should focus on encouraging ROI for charging station developers. P3 can play a huge role in EVSE network expansion. Incentives for local travel (community travel) should focus on long-term demand and EV ownership as OEMs develop more EV model types and at lower costs. Deloitte has provided Federal, state, and local governments with financial advisory services, including P3 business case development.

Wyoming Public Service Commission should mandate utility tariff rates of charging stations be exempt from facing time-of-use on-peak charges, in order to ensure frequent usage of charging

stations. The PSC should also allow for vehicle-to-grid power flow, allowing EV owners to sell power back to utilities from their EVs, particularly to relieve grid stress in demand response events.

Additional incentives may include preferential parking for EVs to utilize while charging as well as access to High-Occupancy Vehicle (HOV) lanes on major interstates and highways. Incentivizing in off-corridor communities should be determined once there is sufficient demand and EV ownership to warrant large-scale deployment of EVSE to rural communities.

3. Conclusion

Wyoming has a significant opportunity to facilitate ZEV infrastructure by developing a robust strategic plan for EVSE placement and incentivization. Infrastructure planning and implementation can help Wyoming to capture a new revenue stream from both in-state and out-of-state travelers. Similarly, adopting an EVSE growth plan can provide incentives for both economic expansion and job growth.

Deloitte is pleased to respond to this RFI to provide an overview of its ZEV infrastructure management consulting services. We are confident Deloitte has the necessary capabilities to support WYDOT in the evaluation and analysis of the State's charging infrastructure.

We welcome the opportunity to discuss our capabilities and insights with you and look forward to further dialogue. Our listed POC is available to answer any questions related to our response or our capabilities related to ZEV infrastructure planning. We look forward to the opportunity to submit a formal proposal in response to an eventual RFP.