



## **V2X and Resilience Project 60-Day Notice Summary Report**

On October 29, 2021, Public Service Company of Colorado (“Public Service” or “the Company”) issued a 60-Day Notice (“Notice”) to update stakeholders regarding the Company’s development of a V2X and Resilience Project to be incorporated into the Company’s 2021-2023 Transportation Electrification Plan (“TEP”) as approved by the Colorado Public Utilities Commission (“Commission”) through Decision No. C21-0017 in Proceeding No. 20A-0204E.

The original Notice and accompanying documentation can be found on the Company’s website:

[https://www.xcelenergy.com/company/rates\\_and\\_regulations/filings/transportation\\_electrification\\_plan](https://www.xcelenergy.com/company/rates_and_regulations/filings/transportation_electrification_plan)

The Company received written comments on the Notice from the City of Boulder, provided as Attachment A; and collectively from the Southwest Energy Efficiency Project (“SWEEP”), Western Resource Advocates (“WRA”), Conservation Colorado, and Energy Outreach Colorado (“EOC”), provided as Attachment B; and from Fermata Energy, provided as Attachment C.

The Company appreciates the time, attention, and thoughtful review of the V2X and Resilience Project 60-Day Notice from interested stakeholders. Verbatim excerpts from the comments are provided below and the Company’s responses to all comments received:

### **1. Comments Submitted by City of Boulder**

Boulder enthusiastically supports this feasibility study and demonstration. V2X technology applied to fleets offers substantial promise to capture the grid benefits of stationary battery storage (e.g., back-up power, peak demand reduction, frequency and voltage regulation, transmission and distribution system deferral and emissions reduction) from electric vehicle batteries that may be parked for long periods of time. The V2X Feasibility Study and Demonstration Project will quantify these benefits in support of future Transportation Electrification Plan products and rate design.

#### **Comment:**

The City of Boulder proposes an expansion of the V2X and Resilience Project to include currently available operational data from the North Boulder Recreation Center vehicle-to-building pilot in the Phase 1 Feasibility Study as well as to add a Boulder fleet vehicles and additional bidirectional charger in the Phase 2 Demonstration.

Boulder launched the first bidirectional electric vehicle charging project in Colorado in September 2020 and now has more than a year of experience operating the vehicle and charger, including navigation of the interconnection process. Inclusion of Boulder in the V2X and Resilience Project will support both the Phase 1 Feasibility Study and the Phase 2 V2X Demonstration.

Boulder currently operates fourteen fleet vehicles with V2X capability (two Nissan LEAFs model year 2018 or later as well as 12 Mitsubishi Outlander Plug-In Hybrids) with plans to add at least sixteen additional V2X-capable electric vehicles in 2022.

In the 60-Day Notice, Public Service identified six criteria for site selection. Boulder has sites and vehicles available to meet all criteria.

One goal of the Feasibility Study is to allow Public Service, the Commission and stakeholders to gain insight into V2X current capabilities and near-term possibilities. The Feasibility Study also proposes to answer questions such as:

- What impact does frequent charging have on a vehicle's battery longevity, performance and warranty?
- What options are available for bi-directional charging, how common place is this infrastructure expected to be and what incremental costs are associated?
- How is the value V2X can bring to the grid quantified, both from a distribution level and system benefits?

Boulder's inclusion in this project can help to answer these questions today. Public Service can launch the study with real-world data on day one, which will add to the body of knowledge on V2X technology and benefits.

Public Service states that the research conducted in Phase 1 would inform the Phase 2 V2X Demonstration. The demonstration will identify three to five locations at partner sites to deploy V2X technology with the intent of determining how V2X could be deployed and incorporated into an emergency preparedness plan. Boulder operates critical infrastructure that could be included in the Phase 2 Demonstration. For example, a bidirectional charger at the Boulder Municipal Services Center ("MSC") building could be attractive for the following reasons:

1. The MSC is a critical facility and offers the ability to test V2X resilience benefits.
2. The MSC is the parking location for many city fleet vehicles. Siting a bidirectional charger at this location offers the opportunity to study the ability to use multiple vehicles to capture V2X benefits.
3. The MSC site offers access to medium- and heavy-duty vehicles in the city fleet for future expansion of V2X testing.

Boulder also has strong partnerships with Boulder Valley School District, Via Mobility and the University of Colorado, all of whom have growing electric transit fleets that offer

opportunities to investigate V2X technology in that sector. Therefore, Boulder would welcome being referenced in the 60-Day Notice as a potential partner for Phase 2 effort.

**Response:**

The Company appreciates Boulder's comments and recognize their pioneering efforts in V2X with their current project. Public Service will be looking for partners to assist in both phases and would like to interview the City of Boulder during the feasibility study phase (Phase 1) of the project to incorporate their current findings into our white paper. The Company recognizes the importance of the Municipal Services Center and will consider a potential deployment at that site during Phase 2.

**2. Comments Submitted by SWEEP, WRA, Conservation Colorado, and EOC**

The Company received one suggestion from these organizations.

**Comment:**

We generally support this project as proposed, with one suggestion: Expand the definition of equity here to include investigating whether or how V2X can be an added revenue opportunity for school districts.

In the first phase of the project, include a review of the financial and technical feasibility of including V2X technology as part of battery-electric school buses. The report should include a review of the net revenue streams that could be unlocked through this path, and what steps would be necessary to maximize them.

If the approach looks feasible, in Phase 2 of the project, the Company should include a school bus deployment as part of the technology demonstration. The Company should work with a school district that serves disproportionately impacted communities (perhaps measured by the amount of free or reduced cost lunch they provide students), or is located in a higher emissions community; that also has or is acquiring a battery-electric school bus. Deploy pilot V2X infrastructure and report back to the school district and to stakeholders about the performance of the technology in providing financial benefits, in addition to resilience.

**Response:**

The Company intends to include a review of potential revenue opportunities for customers within the feasibility study. The concept of leveraging battery-electric school busses is also a use case the Company wishes to investigate. Public Service intends to include a review of potential value streams that could be unlocked as part of the feasibility study (Phase 1). In anticipation that such an approach would be feasible we have opened discussions with Aurora Public Schools around using their newly acquired electric buses as part of a demonstration.

### **3. Comments Submitted by Fermata Energy**

The Company received suggestions for both phases of the project.

#### **Comment:**

Phase 1—Feasibility Study - The Company proposes hiring a consultant to comprehensively review the current V2X technology landscape. Fermata welcomes the opportunity to be interviewed by the Company’s consultant to share our experience with the following topics, as informed by our project deployments (with fleets and utilities) and partnerships with automotive manufacturers, which were listed in the 60-Day Notice:

- What vehicles are expected to be equipped with V2X technology and at what incremental costs?
- What impact does frequent charging have on a vehicle’s battery longevity, performance, and warranty?
- What options are available for bi-directional charging, how commonplace is this infrastructure expected to be, and what incremental costs are associated?
- How is the value V2X can bring to the grid quantified, both from a distribution level and system level benefits?
- Would EV owners participate in V2X programs at incentive levels commensurate to the value provided to the grid?

#### **Response:**

The Company appreciates Fermata’s openness and will interview them and other electric vehicle supply equipment providers to gain knowledge on the state of the industry.

#### **Comment:**

Phase 2—V2X Demonstration - Public Service writes that the feasibility study completed in Phase 1 will inform Phase 2, defined as a “limited scale deployment as proof of concept. The Company believes that the most immediate use case to explore is V2B for resilience purposes.” While we agree with the Company’s finding that “some auto manufacturers are beginning to support the use of vehicles for emergency back-up power”, we urge the Company to wait to review the findings in the Feasibility Study before focusing solely on V2B applications as a demonstration for resilience because our own deployments demonstrate the viability of grid-connected in addition to behind-the-meter V2X applications (including demand charge management, demand response, etc.).

Considering all V2X use cases will enable the Company to better understand how it can support the rapid adoption of EVs in Colorado and beyond. The Company writes “the use of V2B in emergency situations may or may not require specific interconnection agreements that are typically required when generation resources run in parallel with the utility grid, but this will need to be evaluated.” We recommend Public Service take the V2X Demonstration phase of the proposed project to evaluate interconnection

requirements to ensure safe and reliable interconnection of vehicles that will provide non-exporting V2B services, and grid-exporting V2G services. We suggest the Company examine whether specific interconnection agreements are needed for non-exporting V2B service, and whether additional protections are needed for grid-exporting V2G services beyond those required for grid-connected distributed energy generation.

In the proposed scope of the V2X demonstration project, we agree with the Company's proposal of selecting sites that include critical infrastructure in underserved areas that are most prone to outages due to natural disaster or other emergency events.

**Response:**

Thank you for your feedback, the Company recognizes the wider applications to bidirectional technology, and we intend to review how V2X fits within existing interconnection guidelines and whether modifications may be warranted in the future.

**Comment:**

Education and Outreach Efforts - The Company discusses the use of the feasibility study (also referred to as the "white paper") to educate key stakeholders and communities within its service territory. It also says it "plans on hosting in-person or virtual events to allow the stakeholders to see the technologies in demonstration and learn about their practical application. This may include events like 'touch and see,' question and answer sessions, ribbon cuttings, tours, and more." To the extent practicable for our V2X users in Denver and Boulder, we can arrange tours of our deployment sites, question and answer sessions, and "touch and see" events for the Company and its stakeholders to observe our V2X projects in operation.

**Response:**

The Company appreciates Fermata's openness and will consider this option as part of the "touch and see" events planned in the demonstration phase of the project.