To: Anne Heath, City of Coburg

Date: June 30, 2020

From: J. Bell

Subject: Report and Update

Report Findings:

Over the past few weeks, I have completed some research on Oregon related documents (see list attached) that examine the post major earthquake emergency situation. Here are the findings along with the source they are from:

A Large Cascadia Type Earthquake:

a.) Destroys most pipelines, much of the electrical grid, many bridges, railroads, and some highways in Western Oregon *[Oregon DOGMAI Report],*

b.) 100% of Oregons' gasoline, diesel and jet fuel come from Washington or other external points (Canada or Midwest USA), and

c.) Over 90% of that fuel comes through St. Johns' POL facility in Portland, Oregon which is located on landfill soils next to the Willamette River. The State of Oregon predicts that most of that facility will be destroyed by earthquake shaking. *[Oregon Fuel Action Plan]*

d.) **Within a week, almost all gasoline and diesel will be used up after the quake in western Oregon** *[Oregon Fuel Action Plan, and Distributed Energy Resiliency Study – Prepared for the Oregon Dept. of Energy.].*

e.) **No fuel and no transport = no food deliveries to supermarkets/ stores**

f.) Oregon has few backup energy sources, only scattered solar and wind power in isolated areas. It will take months to get seaports operating after tsunami damage, and more months to get pipelines and railroads operating.

g.) The Oregon Dept. of Energy is predicting that it will take **4 to 10 months** (or more) to resupply fuel in Oregon. Limited supplies will be flown in the military, but that will barely cover EMS needs. Everyday life in Oregon after a large earthquake will not be sustainable due to lack of fuel and the food shortages it will create. *[Oregon Fuel Action Plan, and Distributed Energy Resiliency Study – Prepared for the Oregon Dept. of Energy.].*

h.) One likely scenario is that FEMA and the state will order mandatory evacuations of select areas/cities to central Oregon or further inland so that people have adequate shelter, food, and needs. FEMA already has listed Redmond as such a location.

Long Term Mitigation of Sole Source Energy Loss from a Major Earthquake – Oregon & Coburg

1. Either store extra fuel in state (with cost and potential spill problem), and/or
2. ***Develop energy source diversity within the state and city over time to reduce energy shortfalls post disaster.***

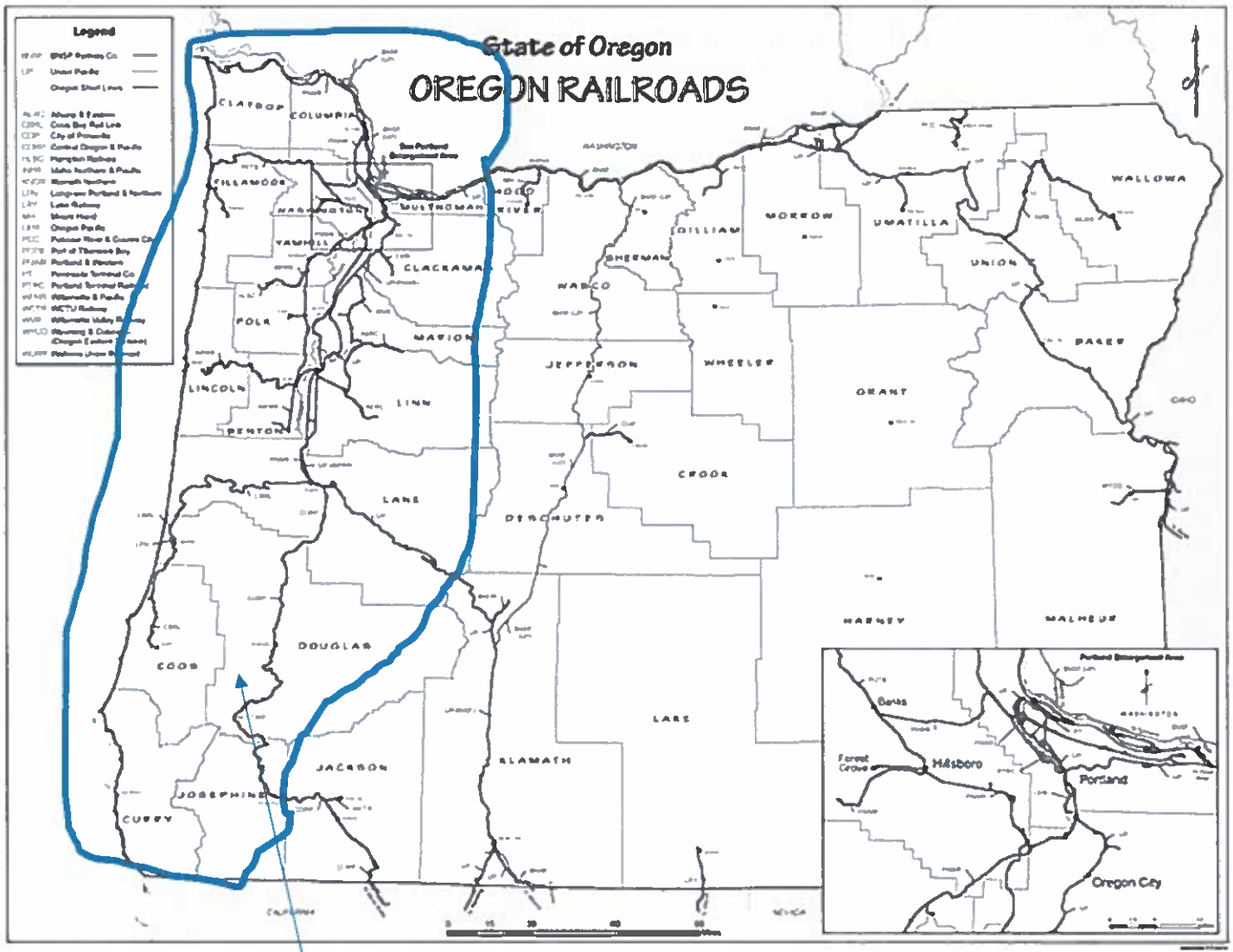
Proposal:

Over the next 5 to 10 years the City of Coburg should purchase solar power generation systems to supplement the existing fragile energy system. These might be located at the wastewater treatment facility and/or atop city hall. The city should make these systems resistant to earthquakes, and able to operate independently if needed. To be most useful, having some electric vehicles for the city would be a real advantage (police and public works).

The City should not rush the development, no one can afford it, but by targeting electric vehicles purchases and a way to make them work during a post disaster fuel emergency it would go a long way to fuel crisis mitigation. The larger issues of food deliveries and sustainable life post major earthquake cannot be addressed at our city level. I would hope the State of Oregon might sponsor programs and incentives that allow individuals, municipalities, and corporations (in coordination with Oregon DOE) to build and operate solar and wind power systems, as Washington and California area.

Sources used:

1. Cook, Jeffrey, Volpi, C. Nobler, E, and Kyle Flanegin. (2018). Check the Stack: An Enabling Framework for Resilient Microgrids. Technical Report NREL TP6A20-71594, NREL U.S. Dept. of Energy.
2. State of Oregon. (2017). Oregon Fuel Action Plan. Oregon Dept. of Energy.
3. State of Washington. (2012). Resilient Washington State: A Framework for Minimizing Loss and Statewide Recovery after an Earthquake. Washington State Seismic Safety Committee, Olympia.
4. R.W. Beck Company. (2011). Distributed Energy Resiliency Study – Prepared for the Oregon Dept. of Energy. Portland, Oregon.
5. Y. Wang, S. Bartlett, and S. Miles. (2013). Earthquake Risk Study for Oregon's Critical Energy Infrastructure Hub. Open Report 0-13-09, Oregon Dept of Geology and Mineral Industries, Portland, Oregon.



AREA OF DAMAGE FROM EARTHQUAKE

ACCESS FROM EXTERNAL WORLD: SEAPORTS, RAIL AND RIVER WITH AIRPORTS AS WELL