The Future of E-Mobility

How establishing a bold vision can shift us to zero.

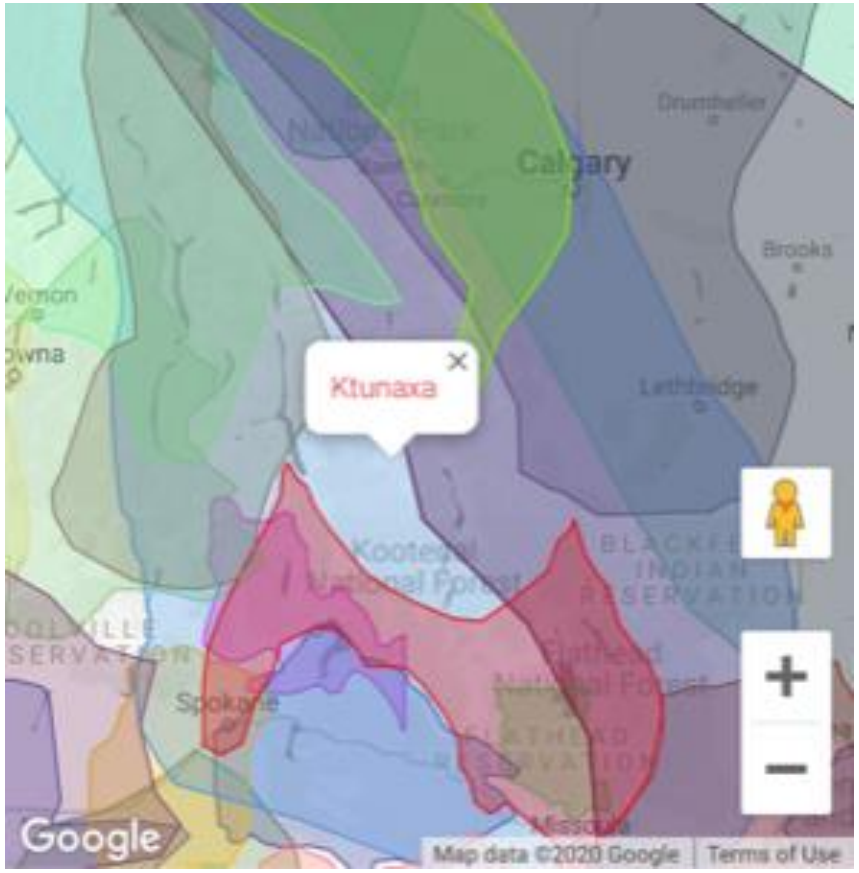
CPAA Conference – Edmonton, Alberta

Megan Lohmann

May 3, 2022

Community Energy Association

Indigenous Recognition



www.whose.land

About CEA

Community Energy Association

CEA is the only non-profit in BC focused exclusively on supporting local governments and Indigenous communities on **CLIMATE** and **ENERGY** activities.

Our Work

Community Energy Association

CEA helps communities with:

INITIATION
- Program design
- Grants
- Regional collaborations

MANAGEMENT
- Manage advisory committees
- RFPs/Vendor selection
- Contract negotiation & mgmt
- Deployment management
- Financial admin & reporting

COMMUNICATIONS
- Program branding, marketing & promotion
- Video production
- Digital communications

CEA has expertise in:

TRANSPORTATION

BUILDINGS

WASTE

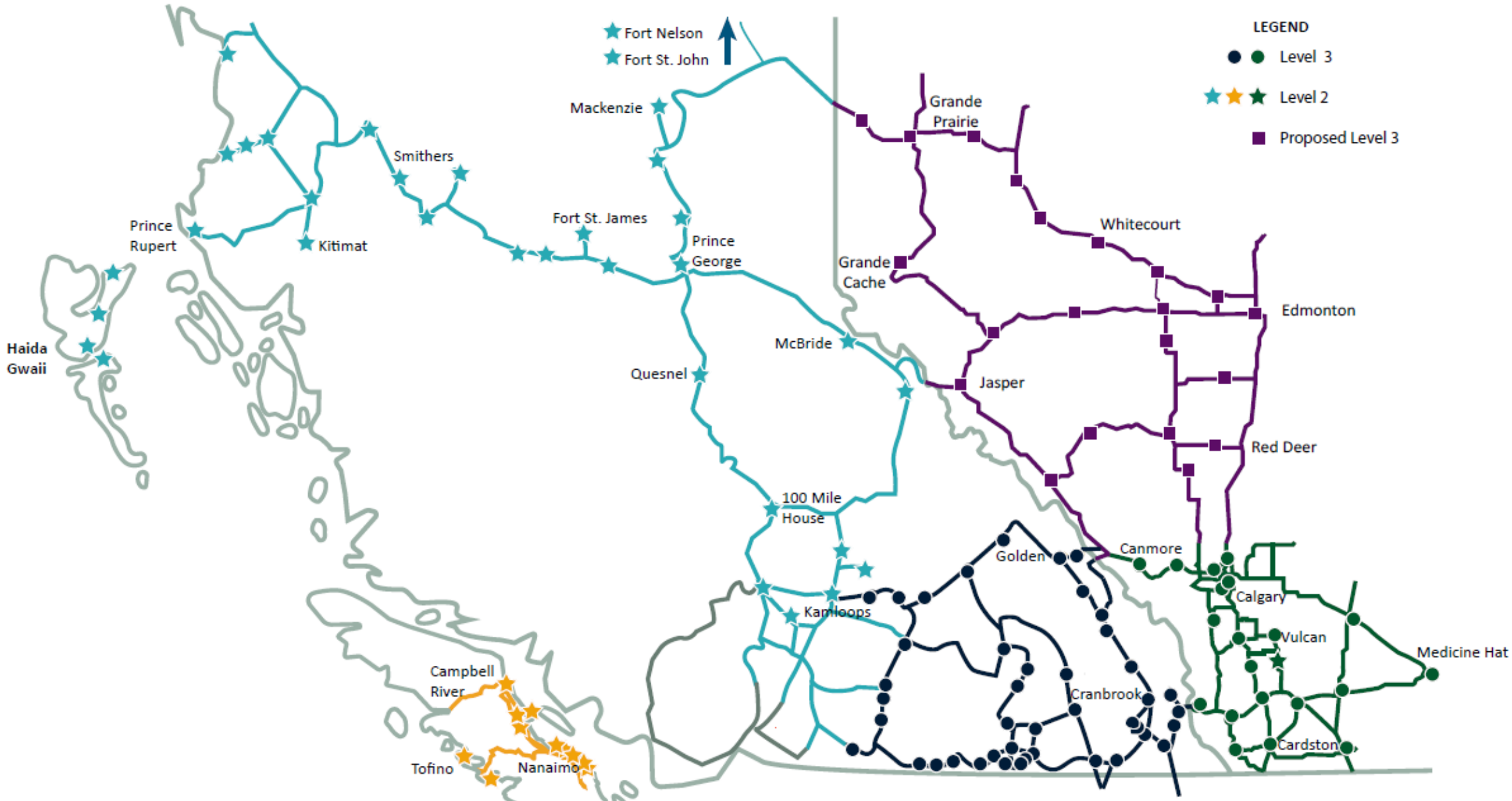
Mid-Island
28 Level 2 Stations

Charge North
58 Level 2 Stations
2,780 km of highway

Eventure Northwest Alberta
20 + DCFC/Level 2 Combined Stations: PROPOSED

Peaks To Prairies
20 DCFC/level 2 combined stations
2020 network complete
1,800km of highway

Accelerate Kootenays
13 DCFC / 40 Level 2's
2018 DCFC network complete
1,800km of highway



EV 101 – The Layers

Technology

Energy/Wire Companies

ATCO Electric

FORTIS ALBERTA

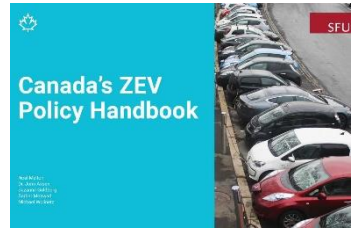
Supply (OEM)

CHEVROLET

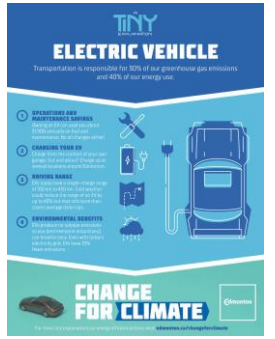
NISSAN

TESLA

Policy



Engagement



EV 101 - Technology

HEV

hybrid
electric vehicle

internal combustion engine
no ability to plug in
high MPG efficiency

toyota prius

PHEV

plug-in hybrid
electric vehicle

fossil fuel and electric
ability to plug in
extended range over BEV

chevrolet volt

BEV

plug-in battery
electric vehicle

no internal combustion engine
battery only
lowest cost per km driven
zero emissions

nissan leaf

electric vehicles (EVs)

EV101 - Siting Criteria

EV 101 - Technology

L1

level 1 charging
AC, 120V

use **at home** (overnight)
use **at work** (all day)

L1 charger

L2

level 2 charging
AC, 240V

use **at home** and **at work**
use **on the go** (curbside, parking lots)

L2 home charger

DCFC

dc fast charging
variable DC voltage

use **on the go** (fast-charge hubs)
use **on the go** (highway travel)

public DC fast charger


flo
ATCO
ATCO


STOP
BLP-1682


PETRO-CANADA
EV Fast Charge
EV Fast Charge

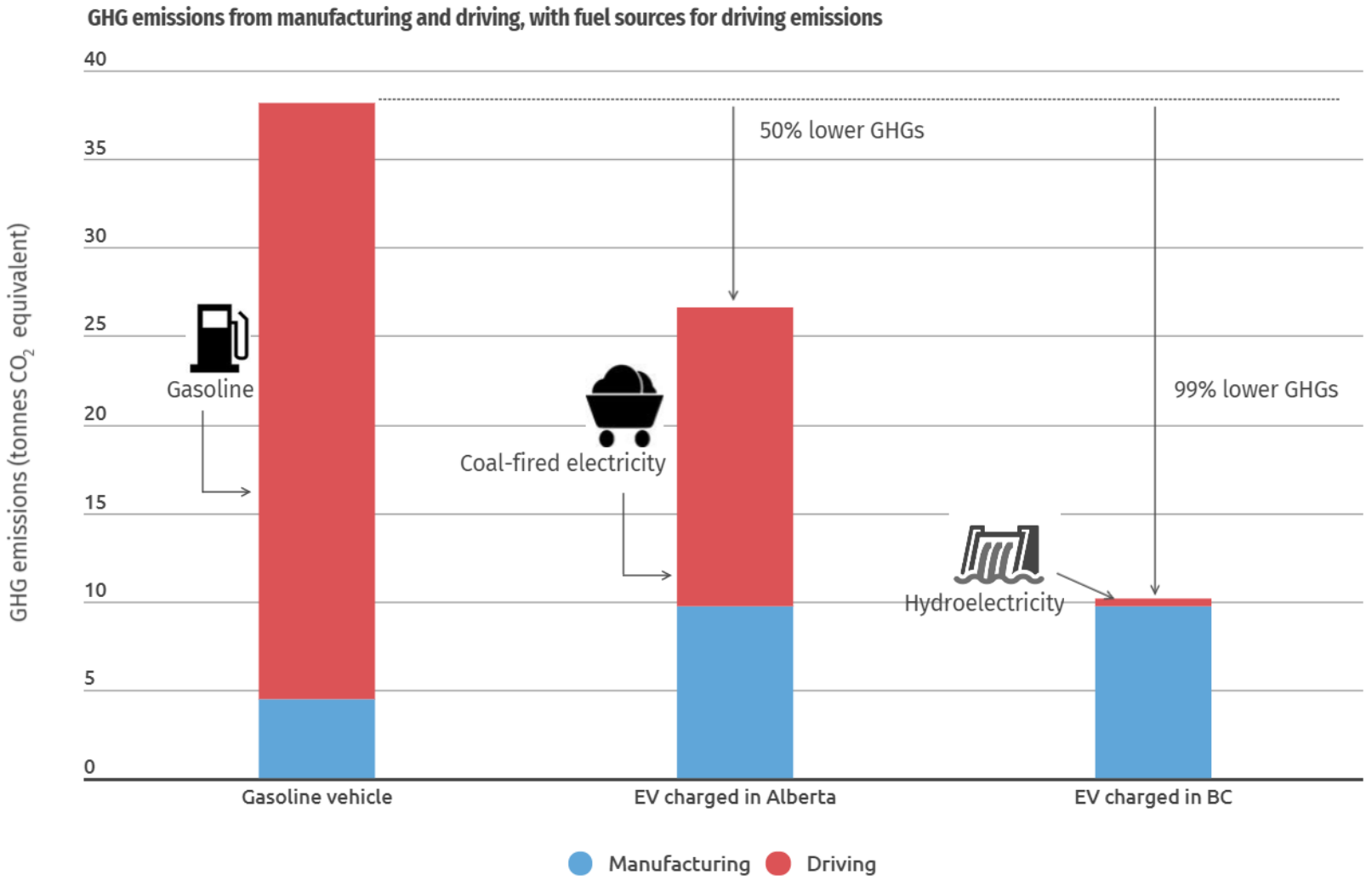

ETS
Edmonton Transit Service
Battery-Electric
By PROTERRA

EV 101 – General Costs

Charger type	Unit Cost	Installation
Networked Level 2	$4,000 + $100 - $200 networking fees	$4,000 - $8,000 (Pedestal) $2,000 - $5,000 (Wall)
Non-networked Level 2	$800 - $4,000	(same as above)
DC Fast Charger (50 kW)	$45,000 - $55,000 + $500 - $8000 networking fees	$60,000 - $80,000
DC Fast Charger (100 kW)	$75,000 - $85,000 + networking fees	$80,000 - $100,000 (assuming transformer upgrade)

EV 101 – Emissions Impact

- EVs have a lower lifecycle impact than internal combustion engines. Even in Alberta.



Source: P. Poovanna, R. Davis and C. Argue, *Environmental Life Cycle Assessment of Electric Vehicles in Canada*, 2018.
EV = electric vehicle

EV 101 – Emissions Impact

- In AB, the environmental burden is ‘paid off’ within 50,000 km (better as grid decarbonizes)
- Production and EOL stages are most intensive

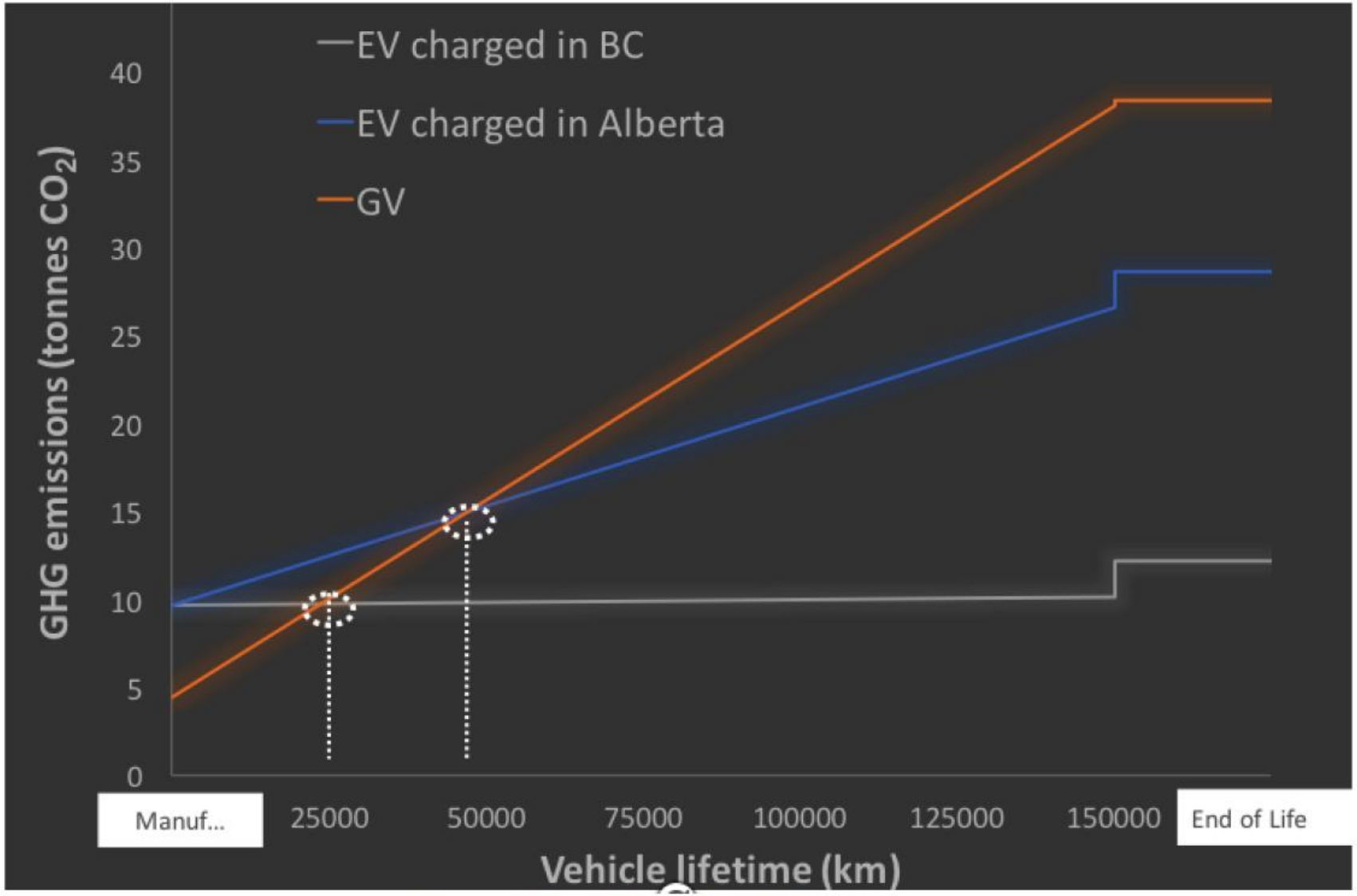
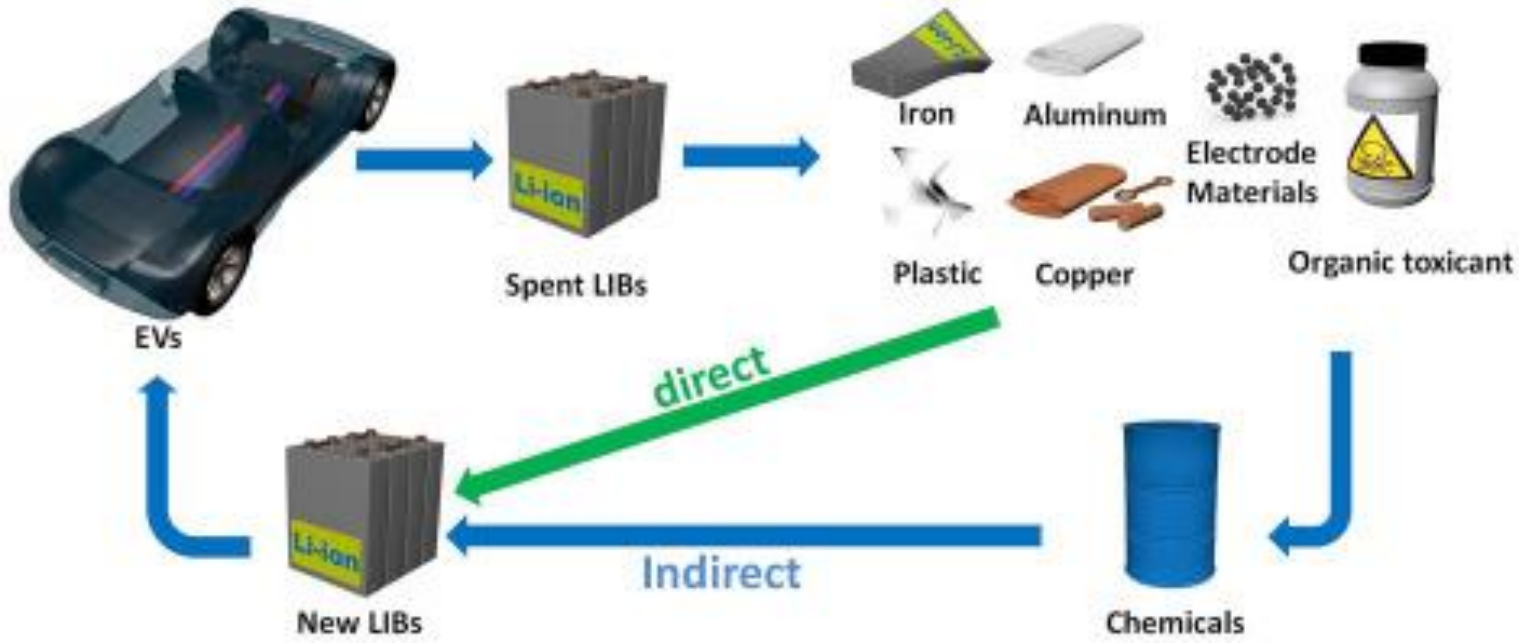


Figure 5 Total life cycle GHG emissions

EV 101 – Emissions Impact

- 99% of lead-acid batteries are recycled, the highest rate of any product...LIB to follow?
- Trail BC has the world's most comprehensive lithium-ion recycling facility



Bold Vision for a Resilient Future

- Maximize the co-benefits and opportunity for your community
- Community building in a resilient, proactive approach
- Demonstrating local applicability of technology

Roles and Responsibilities

Enable Actions

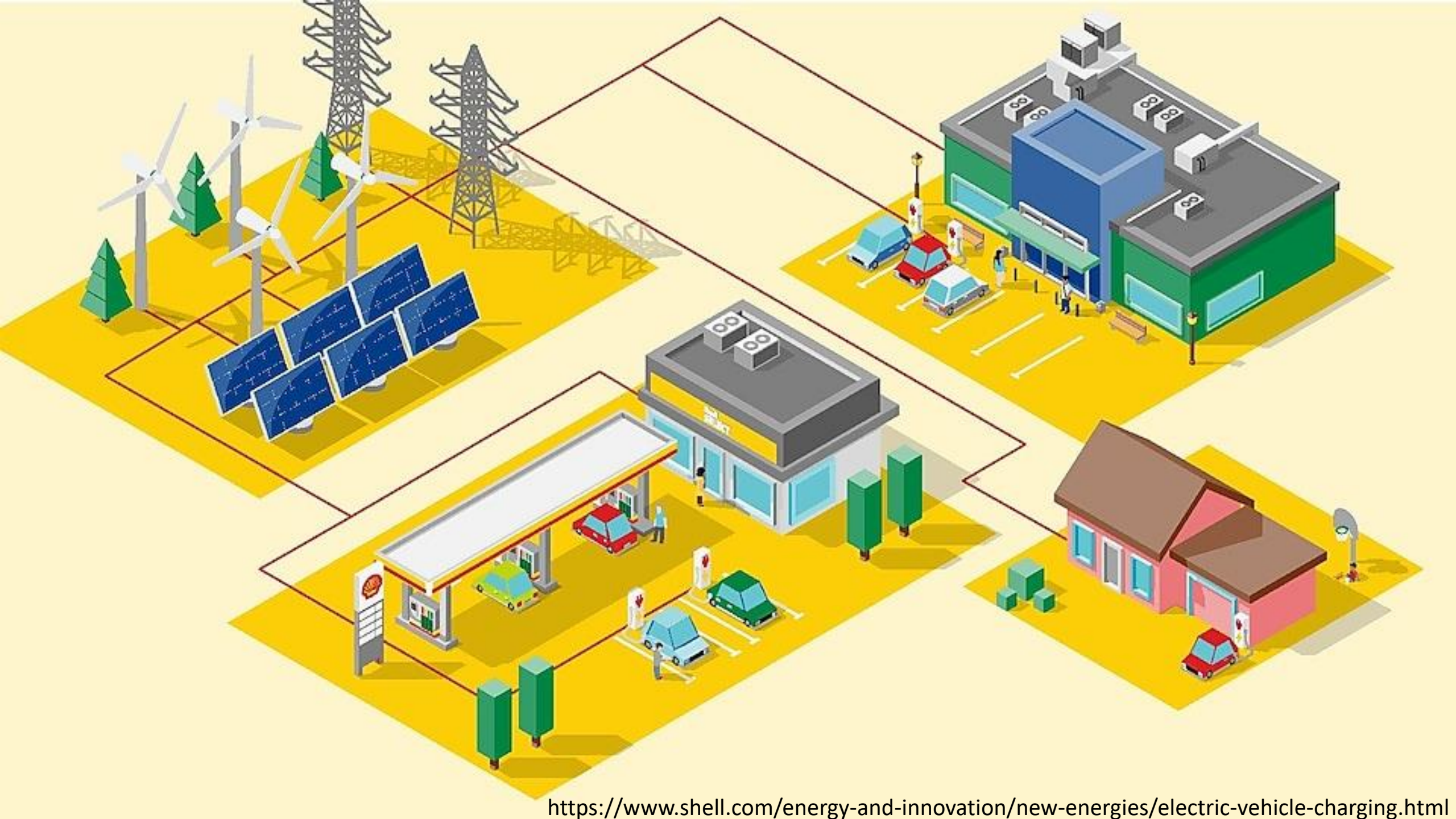
- Through infrastructure decisions – public, private, municipal

Shape Actions

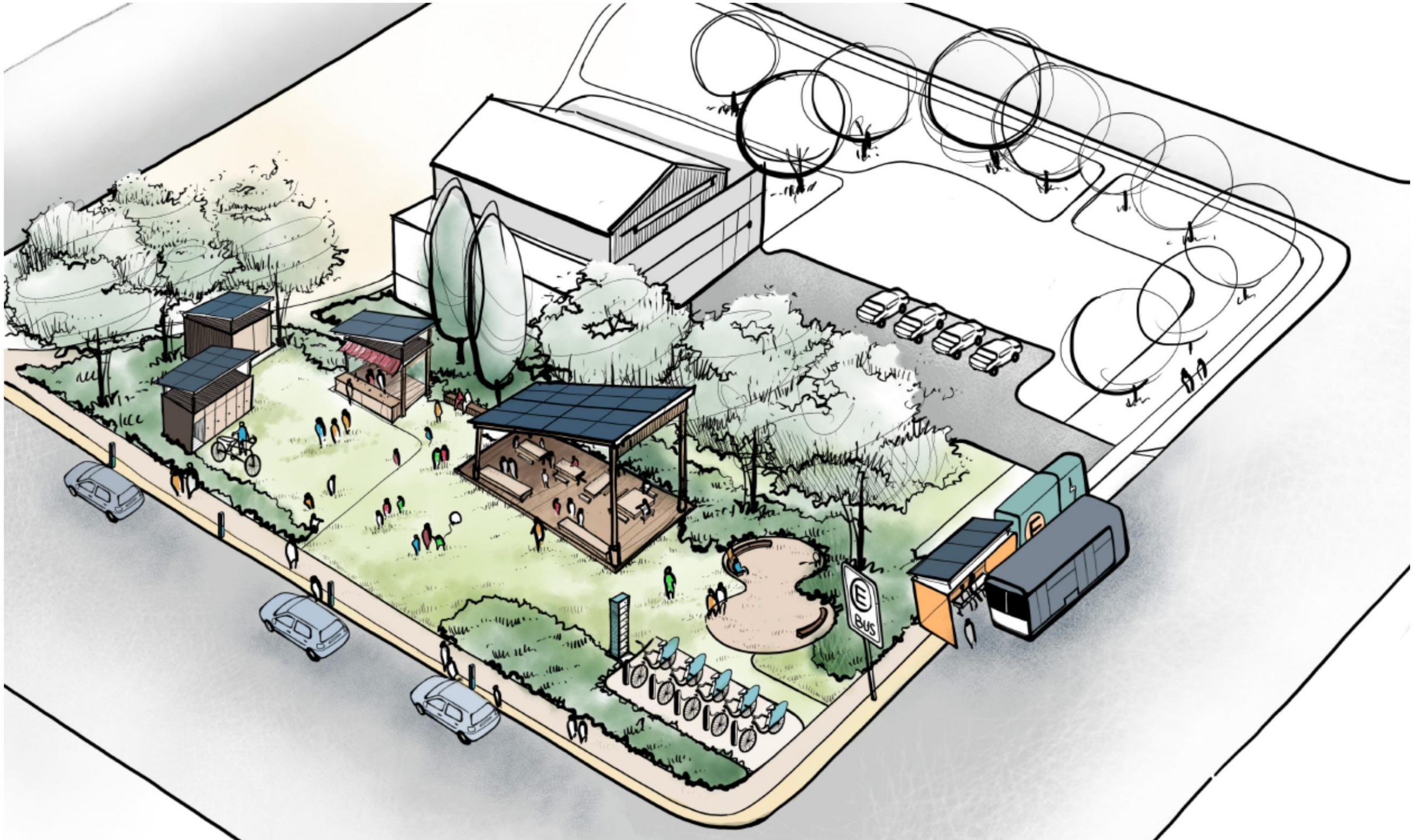
- Through policy and regulation

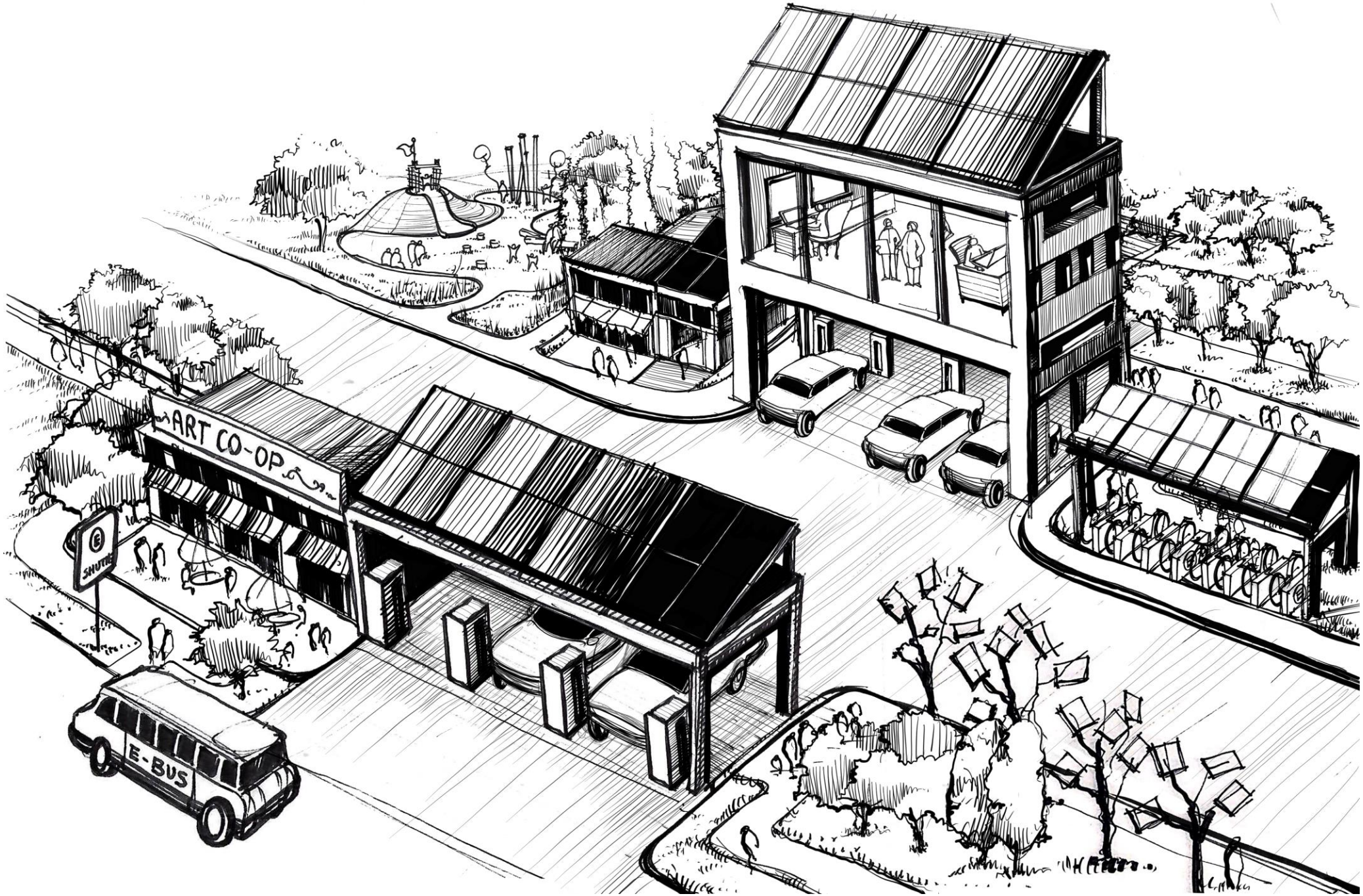
Support Actions

- Through engagement, outreach and leadership

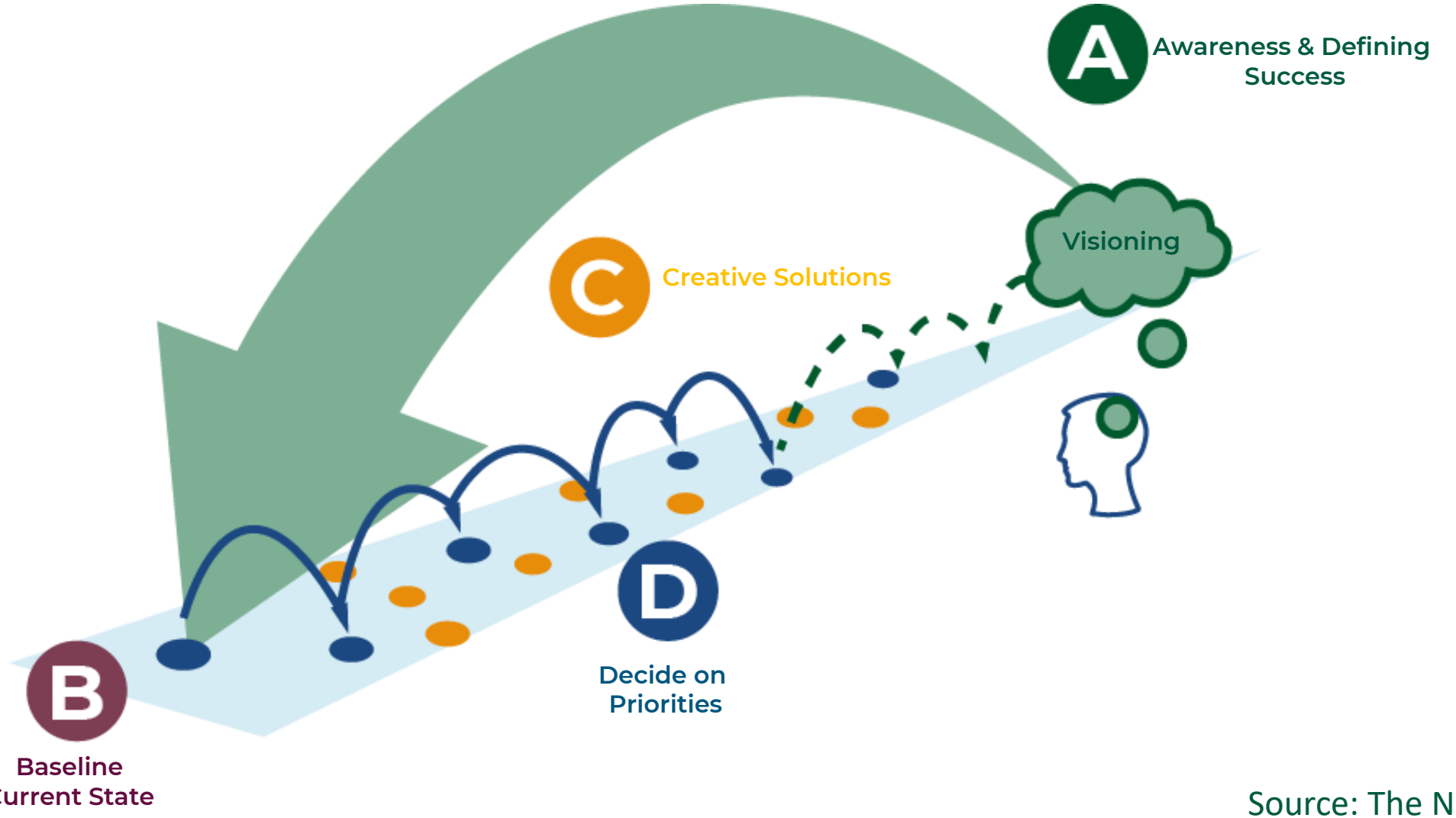


https://www.shell.com/energy-and-innovation/new-energies/electric-vehicle-charging.html


BUS


ART CO-OP
E-BUS

Backcasting as a tool



Source: The Natural Step

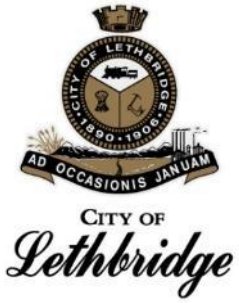

ROTARY LIFT


Peaks to Prairies


SouthGrow
Regional Initiative


SW
ALBERTA
SOUTHWEST


Calgary


CITY OF LETHBRIDGE
1890 · 1906
AD OCCASIONIS JANUAM
CITY OF
Lethbridge


Medicine Hat
The Gas City


MEDICINE HAT
COLLEGE

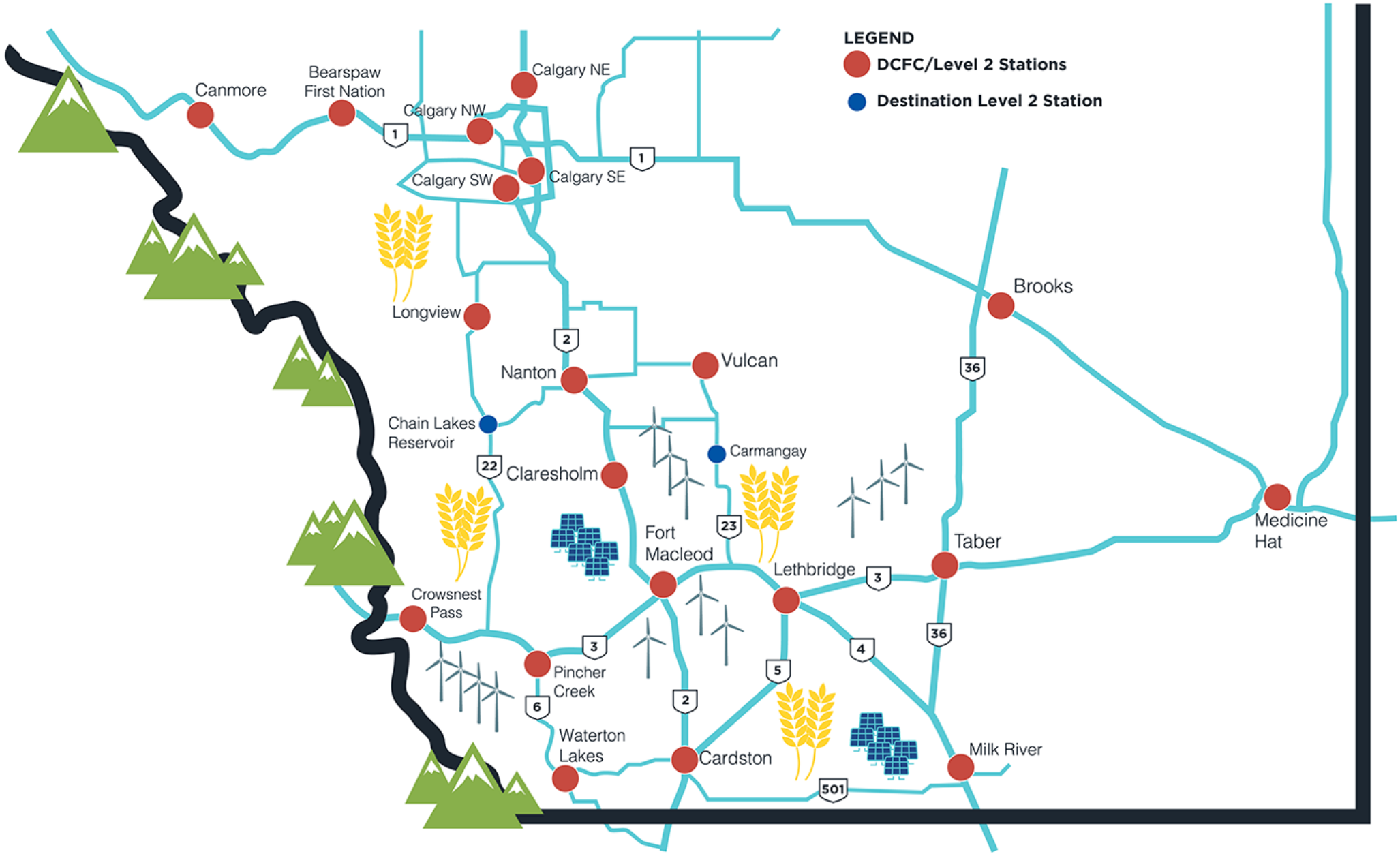

Alberta
Government


FCM
FEDERATION
OF CANADIAN
MUNICIPALITIES
FÉDÉRATION
CANADIENNE DES
MUNICIPALITÉS


Canada


ATCO


Community Energy
Association


LEGEND
DCFC/Level 2 Stations
Destination Level 2 Station
Canmore
Bearspaw First Nation
Calgary NE
Calgary NW
Calgary SW
Calgary SE
Longview
Nanton
Vulcan
Brooks
Chain Lakes Reservoir
Carmangay
Claresholm
Fort Macleod
Lethbridge
Taber
Medicine Hat
Crowsnest Pass
Pincher Creek
Waterton Lakes
Cardston
Milk River
1
2
3
4
5
6
22
23
36
501

$2.16 Million

Total cash investment

>1,400kms

Highway connected for EV travel.

27%

Increase in uses from Q4 2019 to Q1 2020

12,025 kWh

Total energy consumed (June-Dec. 2019)

4,999 Litres

Gasoline avoided

>1,000

Number of people engaged at 16 events throughout the region

137

Number of unique users of the Canmore station in the first 3 months of operation

11,500 kg CO^2e

GHG emissions avoided (June-Dec. 2019)


Eventure
northwest AB

Regional Collaboration

DRAYTON VALLEY

ROCKY MOUNTAIN HOUSE
Where Adventure Begins!

MUNICIPAL DISTRICT OF GREENVIEW No. 16

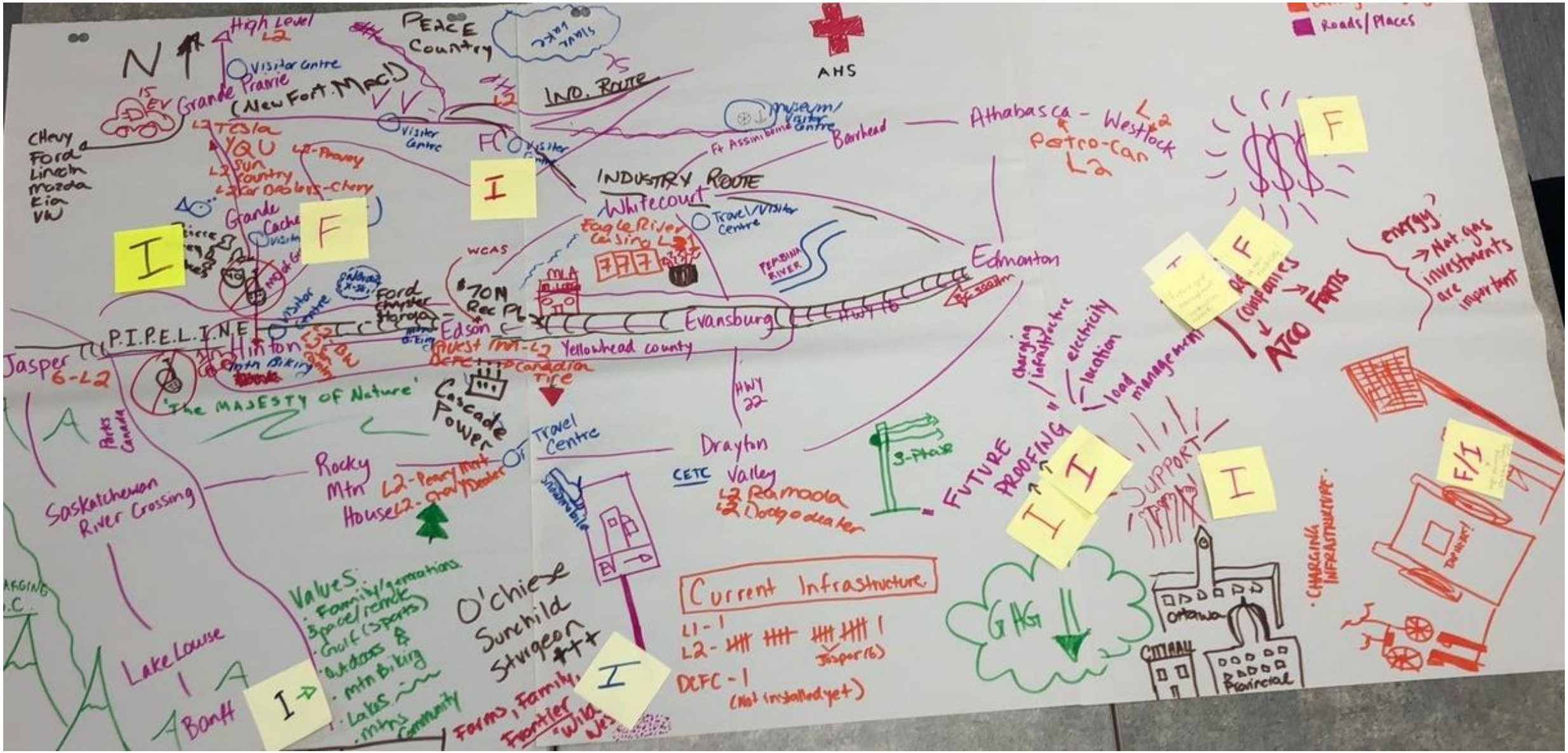
Gateway to the Rockies
HINTON

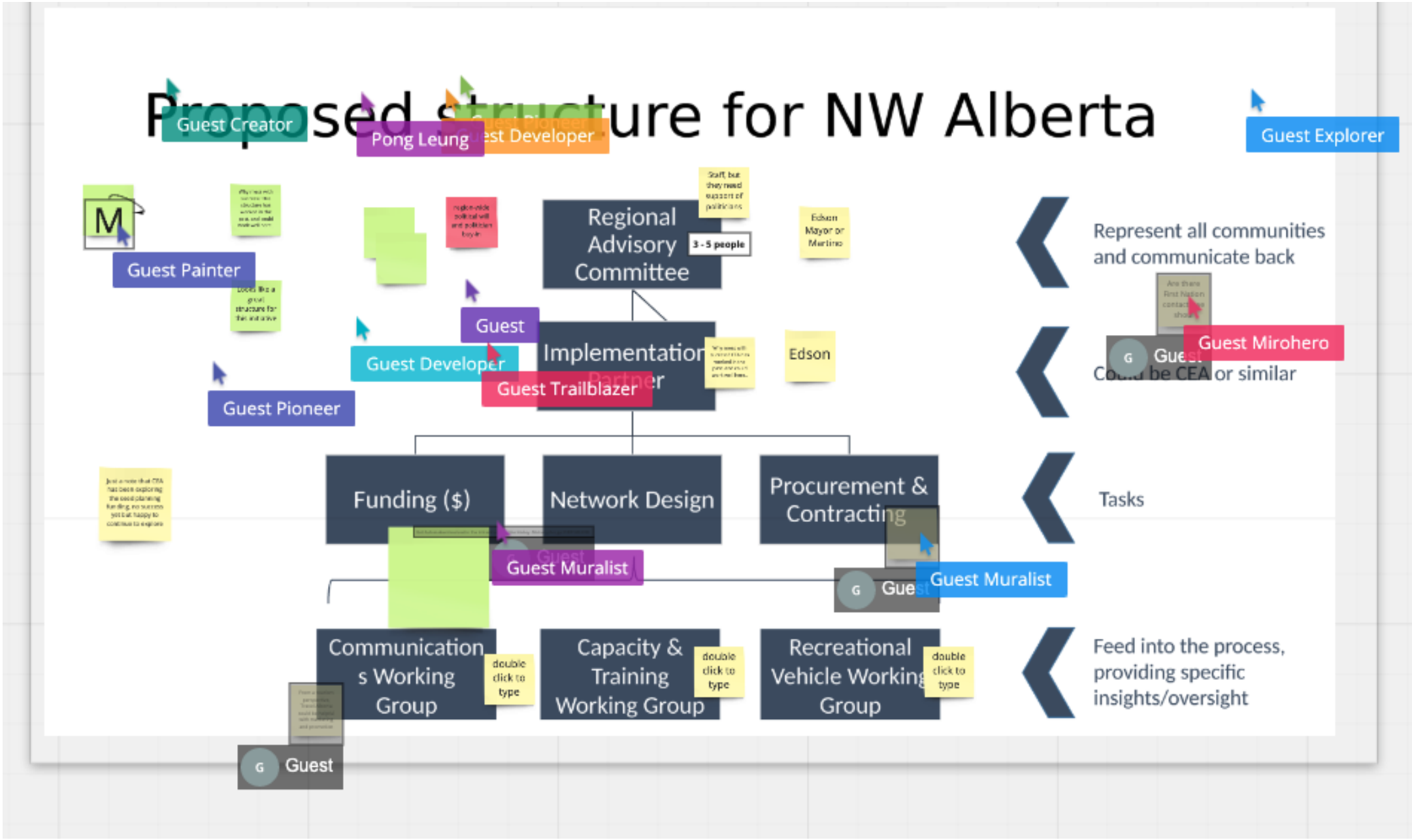
THE CITY OF
GRANDE prairie
CANADA

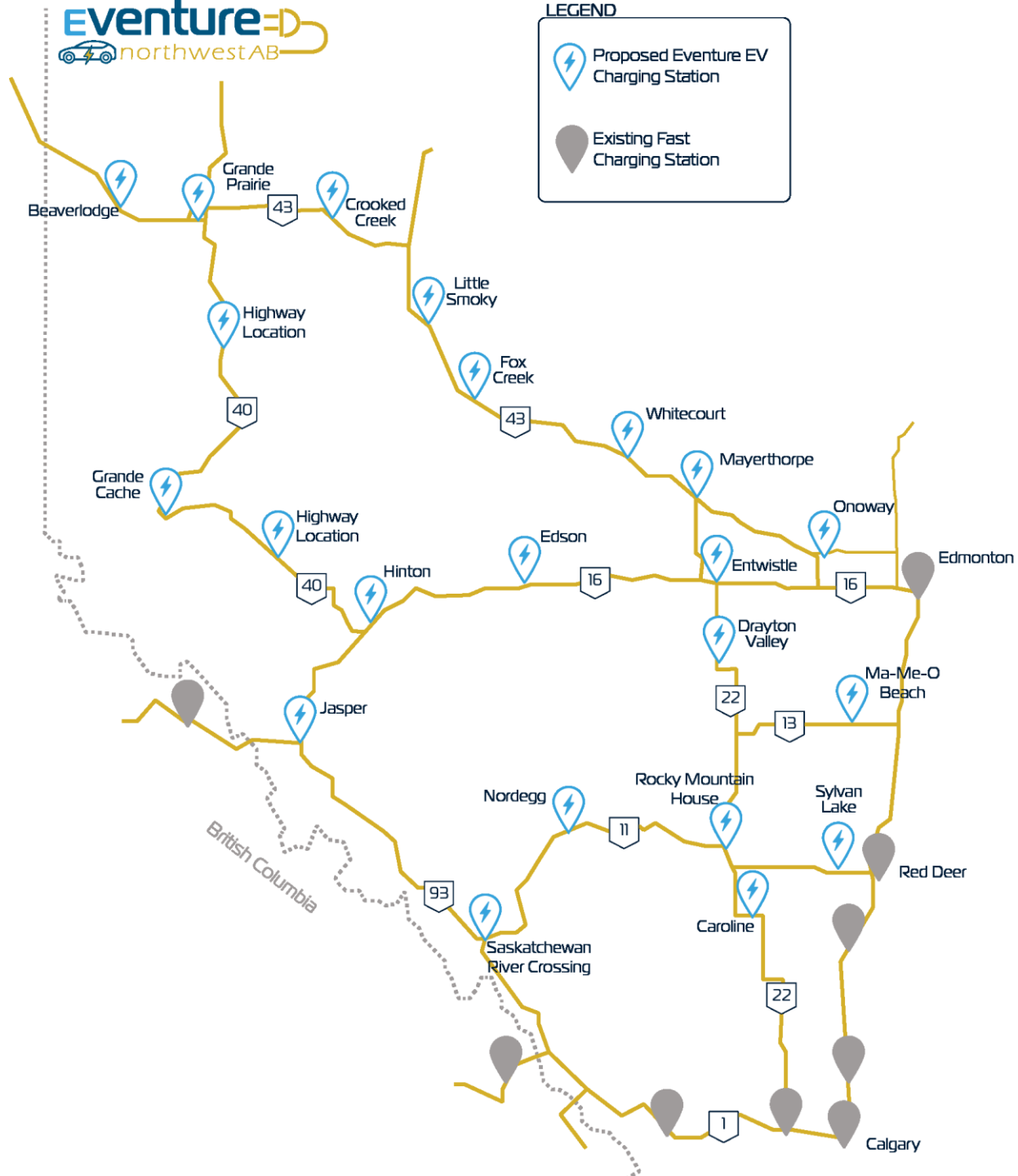
THE CITY OF
Edmonton

Edson

Whitecourt

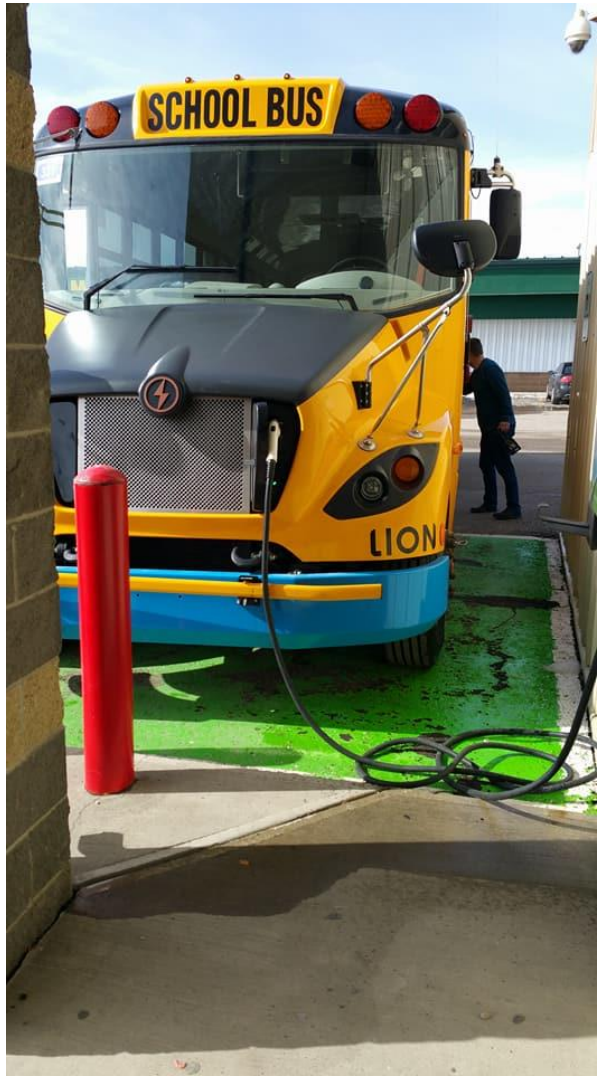

N
High Level L2
Peace Country
Visitor Centre
Grande Prairie
(New Fort Mac)
IND. Route
AHS
Roads/Places
Chevy
Ford
Lincoln
mazda
Kia
VW
YQU
Sun Country
Tesla
Grande Cache
Visitor Centre
Fort Assiniboine
Barrhead
Athabasca - Westlock
Petro-can
L2
INDUSTRY ROUTE
Whitecourt
Travel/Visitor Centre
Eagle River Casino
WCAS
Pembina River
Edmonton
Ford Chrysler Storage
Edson
Evansburg
P.I.P.E.L.I.N.E
Hinton
Yellowhead county
Canadian Tire
Jasper
6-L2
'The MAJESTY of Nature'
Parks Canada
Cascade Power
Travel Centre
Drayton Valley
CETC
Rocky Mtn House
L2-Peavy Mart
L2-Crowsdaler
Saskatchewan River Crossing
Lake Louise
Banff
Values
· Family/generations
· Space/remote
· Golf (sports)
· outdoor &
· mtn biking
· Lakes
· mtns
Community
O'chiese
Sunchild
Sturgeon
Farms, Family, Frontier, Wild
Current Infrastructure
L1-1
L2-
Jasper (6)
DCFC-1
(Not installed yet)
3-Phase
FUTURE PROOFING
charging infrastructure
electricity
location
load management
ATCO Parts
energy
→ Nat. gas investments are important
SUPPORT
GHG
Ottawa
Citadel
Provincial
CHARGING INFRASTRUCTURE
F
I
F/I


Proposed structure for NW Alberta
Guest Creator
Pong Leung
Guest Developer
Guest Explorer
Guest Painter
Regional Advisory Committee
3 - 5 people
Represent all communities and communicate back
Guest
Guest Developer
Implementation Partner
Edson
Guest Trailblazer
Guest Mirohero
Guest Pioneer
Funding ($)
Network Design
Procurement & Contracting
Tasks
Guest Muralist
Guest Muralist
Communications Working Group
double click to type
Capacity & Training Working Group
double click to type
Recreational Vehicle Working Group
double click to type
Feed into the process, providing specific insights/oversight
Guest


eventure
northwest AB
LEGEND
Proposed Eventure EV Charging Station
Existing Fast Charging Station
Beaverlodge
Grande Prairie
43
Crooked Creek
Little Smoky
Highway Location
Fox Creek
40
43
Whitecourt
Mayerthorpe
Grande Cache
Onoway
Highway Location
Edson
Entwistle
Edmonton
40
Hinton
16
16
Drayton Valley
Ma-Me-O Beach
22
13
Jasper
Rocky Mountain House
Nordegg
Sylvan Lake
11
British Columbia
93
Red Deer
Caroline
Saskatchewan River Crossing
22
1
Calgary

Establishing the Bold Vision

- Get the right people in the room to establish the vision
- Identify and detail the collaborative opportunities
- Align with local priorities and pitch the big idea



FACILITATED BY: Community Energy Association

FUNDED BY: BC Hydro Power smart

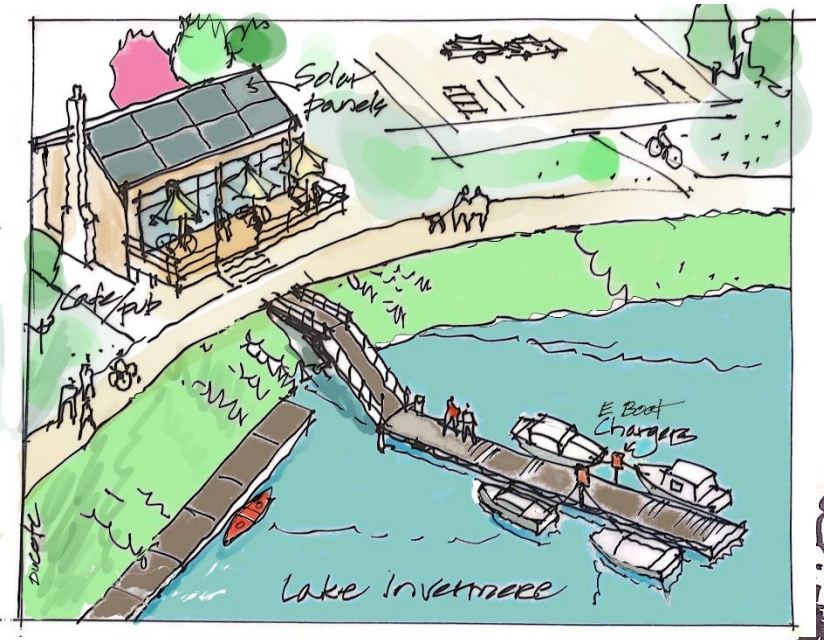
A Vision of E-Mobility for Central/Northern BC

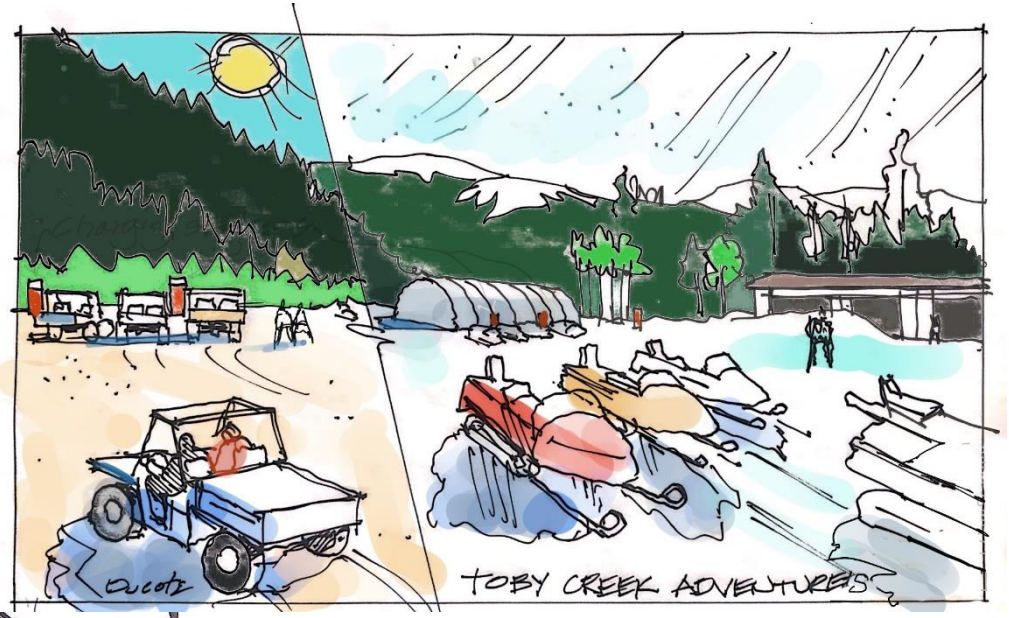
LIVE GRAPHIC RECORDING Melissa Kendzierski | Drawing Change

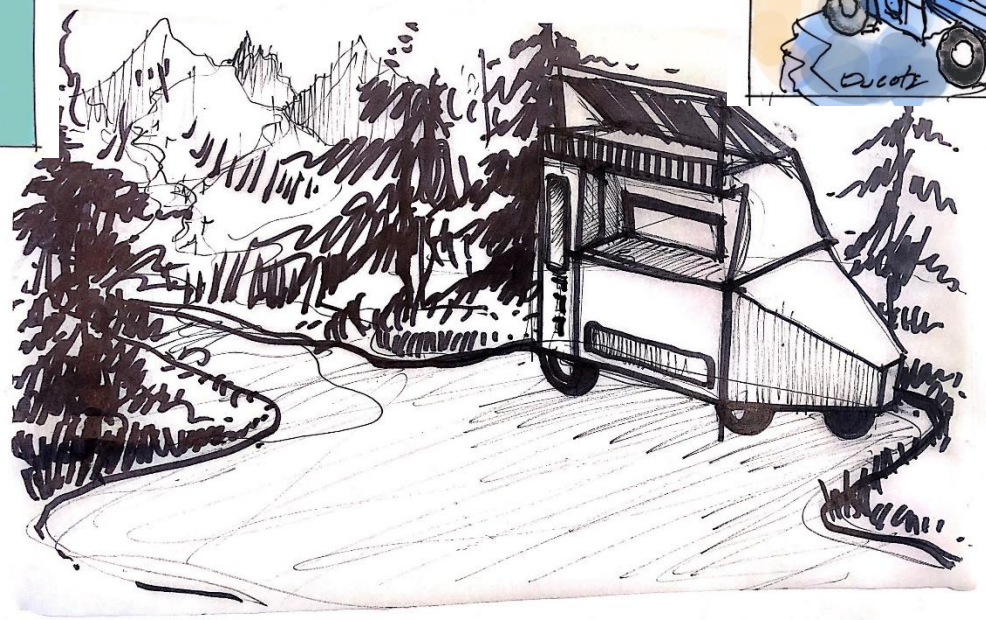
Develop the Vision

Develop the Vision

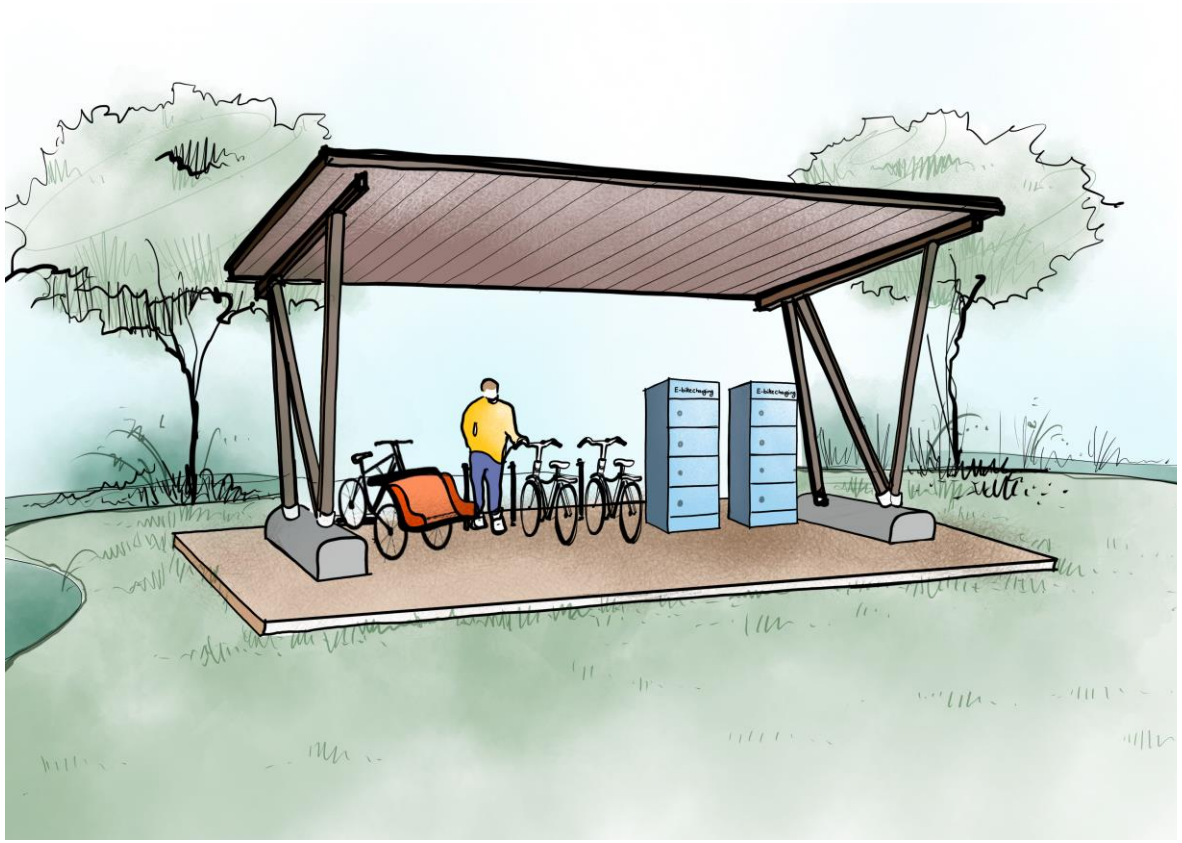
Develop the Vision

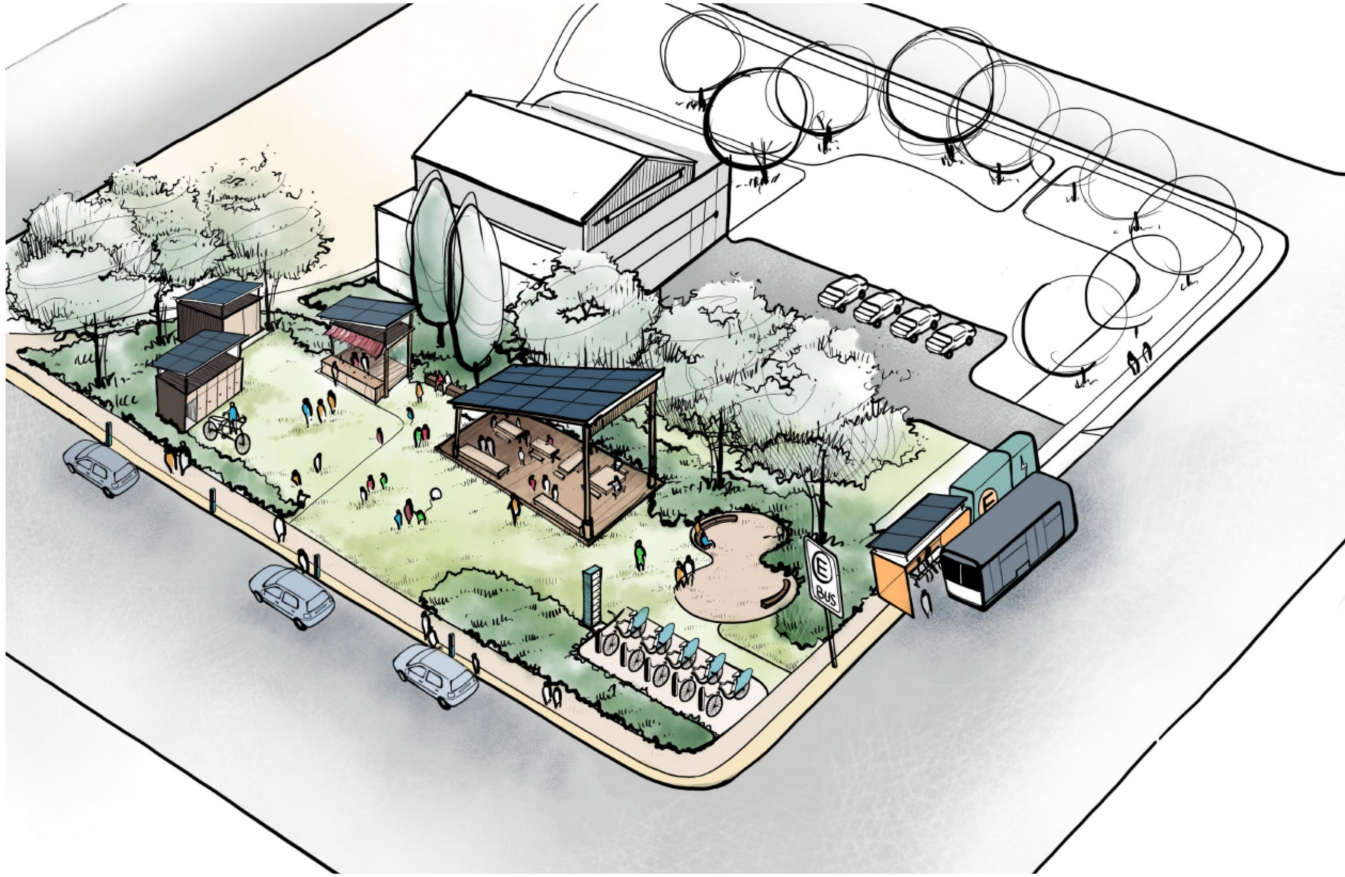




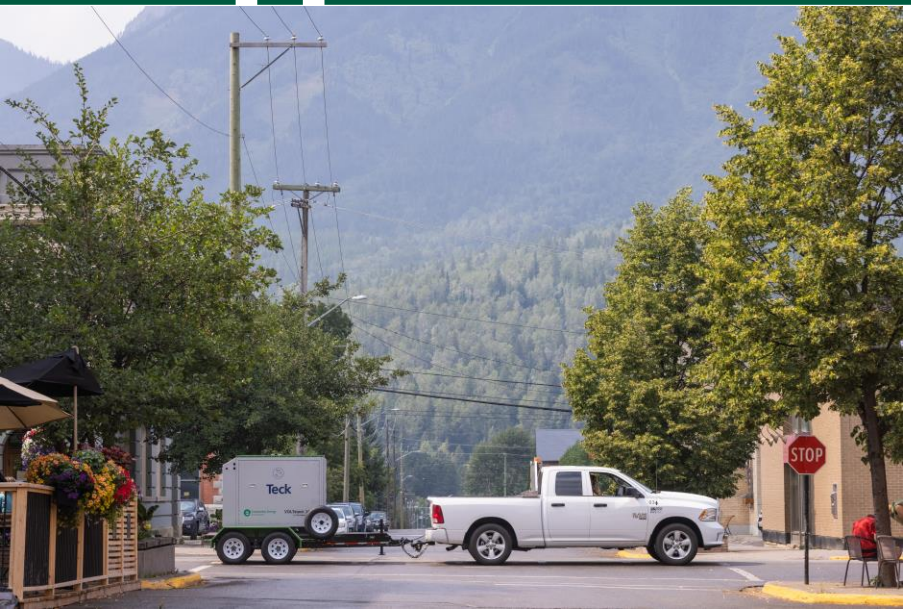


Develop the Vision





Demonstrate local applications



Demonstrate local applications

Demonstrate Local Applications

ATCO

CHARGE UP
AN ENMAX POWER SMART CHARGING PILOT

80%

Eighty per cent of EV charging occurs at 5 p.m., when electricity demand on the grid is highest.

3,000

There are 3,000 EVs currently on Calgary roads.

200,000

ENMAX forecasts indicate there could up to 200,000 EVs on Calgary roads by 2035.

ENMAX

Target 2035 + Beyond
Embracing the challenge

Community Energy Association

- All communities must see themselves in the e-mobility future
- Connectivity to rural areas affects EV adoption in urban centres
- Local context matters. E-mobility is about more than vehicles

- Sioux Lookout, Ontario

Thank you

Megan Lohmann

mlohmann@communityenergy.bc.ca

Community Energy Association

In 2017, St. Albert became the firs
municipality in Canada to own a f
long-range electric buses.

To minimize the environmental impact, the city installe
301-kilowatt solar panel system that supplies around or
third of the transit depot's power and is used to help cha
the buses.

Over an 18 year lifecycle, they're expected to save the city
$386,000 in fuel and maintenance costs