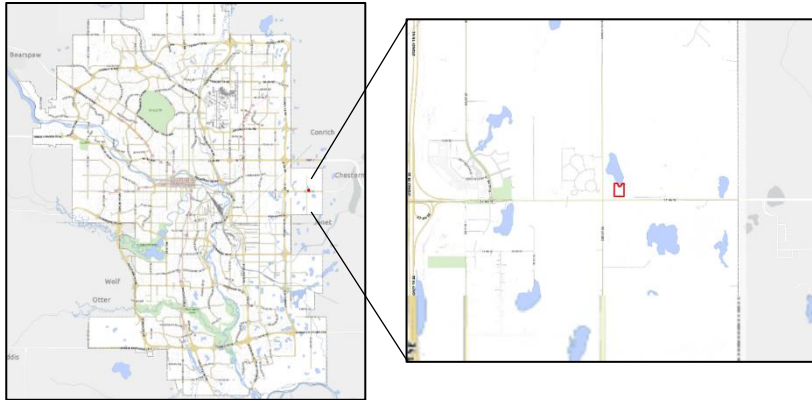


Greenhouse Gas Emissions Analysis

The Greenhouse Gas (GHG) mitigation analysis displayed here compares new community business cases (new communities) to existing communities in both buildings and transportation sectors. Existing communities have already been constructed and are inhabited today, whereas new communities are those that are proposed to be constructed. The comparison indicates the difference in energy use and carbon emissions between existing communities and proposed new communities. For buildings, the emissions for existing communities are generally higher on a per capita basis because they are older and less efficient than new buildings which are built to higher standards. This information is provided for context; however, the comparison is challenging due to two primary reasons:

- 1.) **Building code:** Buildings are constructed to a higher energy performance standard now than previously – so the equivalent buildings in existing communities use more energy than in new communities.
- 2.) **Actual versus modelled data:** The existing community numbers are based on actual consumption data whereas the new communities are based on modelled data provided by HOT2000 modelling.

The GHG analysis displayed here is a new workflow, and the methodology is constantly evolving and improving. This discrepancy has been noted as an area of development for future evaluations of business cases, and analysis in future years may display markedly different results that account for the considerations outlined above.



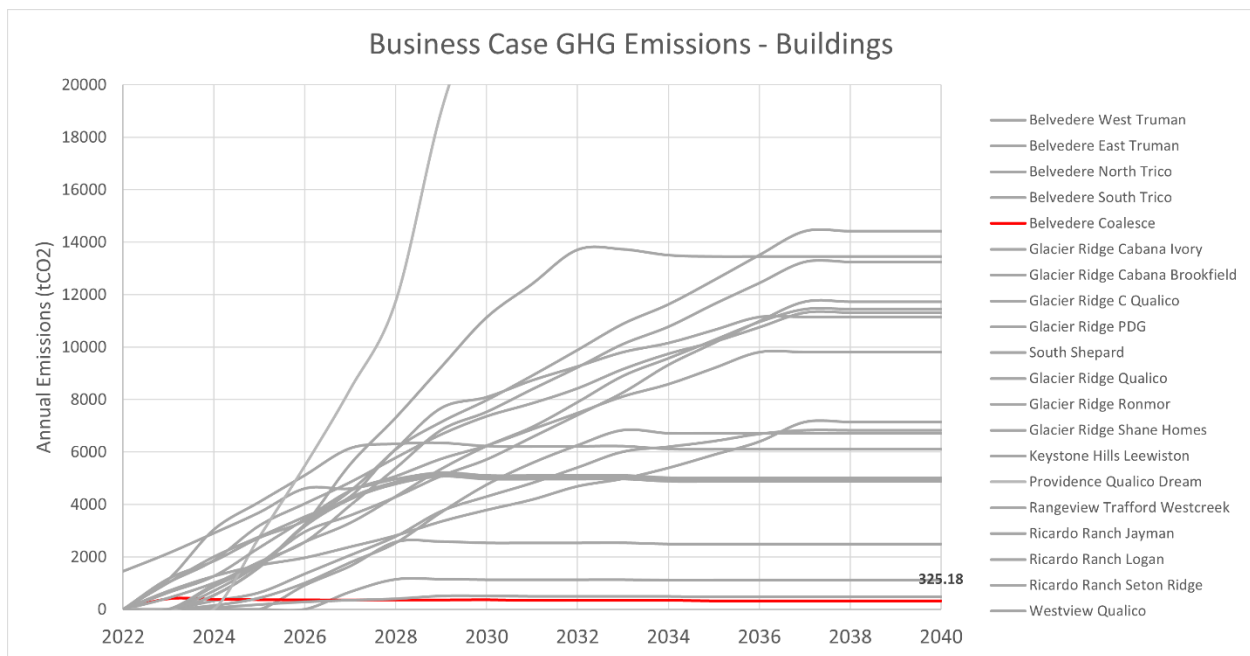
Belvedere Coalesce is a commercial development situated in the east of the city that is planned to begin construction in the year 2023.

Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Single Family	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	66787	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	4000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Green House Gas emissions – Buildings

What we heard: The proponent will, consider solar panels, ventmatic ceiling fans, low E windows, LED motion censored lighting, EV charging



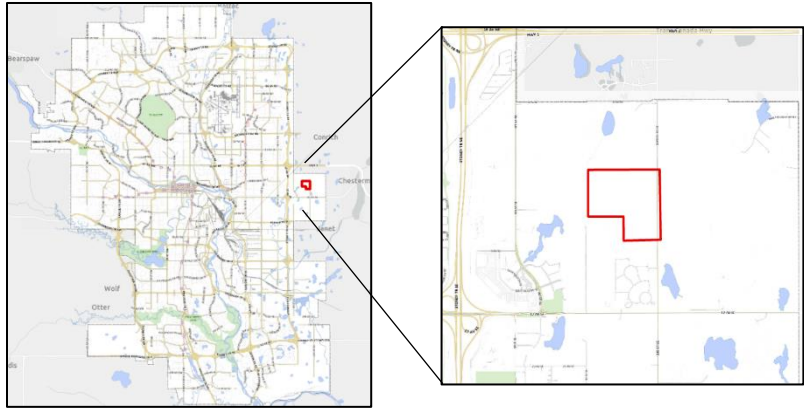
At full build out, annual emissions from the operations of buildings at Belvedere Coalesce are forecasted to be 325.18 tCO₂/year.

Green House Gas emissions – Transportation

At this time, we cannot provide a transportation emissions analysis for Belvedere Coalesce as there no planned residents in this business case.

Mitigating measures - Buildings

At this time, we cannot provide any mitigating measures as The City of Calgary is still developing its modelled emission data for commercial and industrial buildings.



Belvedere North Trico is a mixed-use development situated in the east of the city that is planned to begin construction in the year 2022.

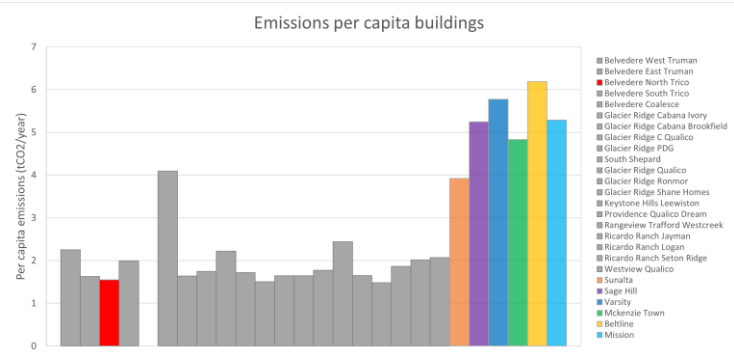
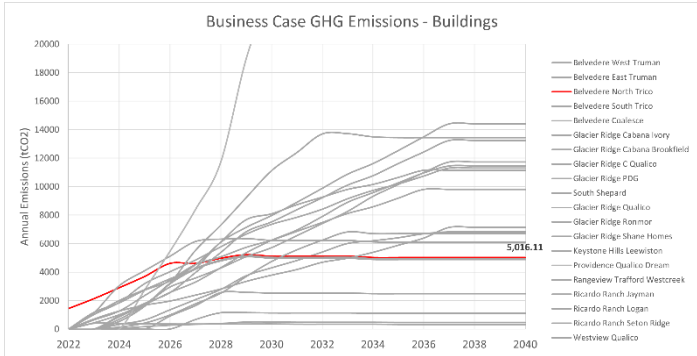
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	0	0	72	0	126	90	0	0	0	0	0	0	0	0	0	0	0
Single Family	140	72	140	140	132	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	140	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	0	0	0	0	9600	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*Diverse housing offering stated therefore assumes 25% of builds are townhomes

Greenhouse Gas emissions – Buildings

What we heard: The proponent will, consider passive solar gain and solar and cogeneration units in the future (no timeline given)

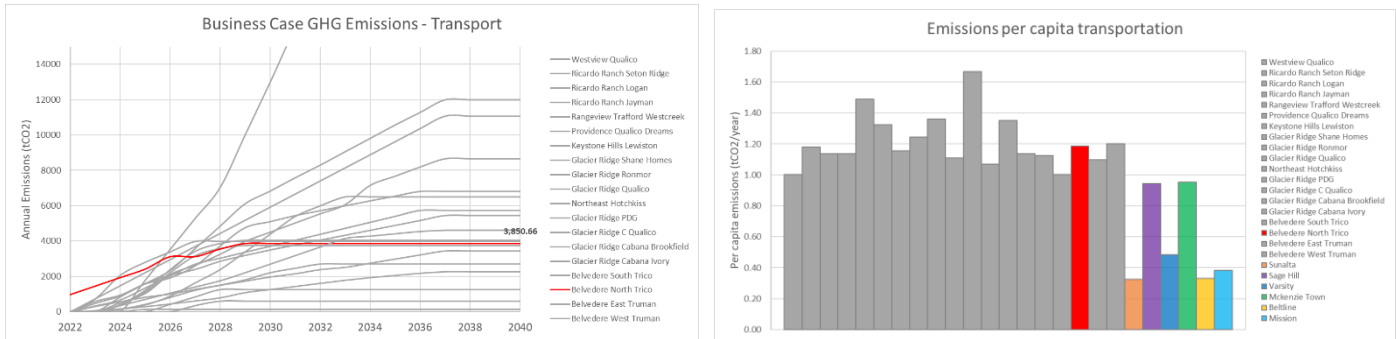


*Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040

At full build out, annual emissions from the operations of buildings at Belvedere North Trico are forecasted to be 5,016.11 tCO2/year, this equates to an emission per capita of 1.54 tCO2 at full build out. Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.

Greenhouse Gas emissions – Transportation

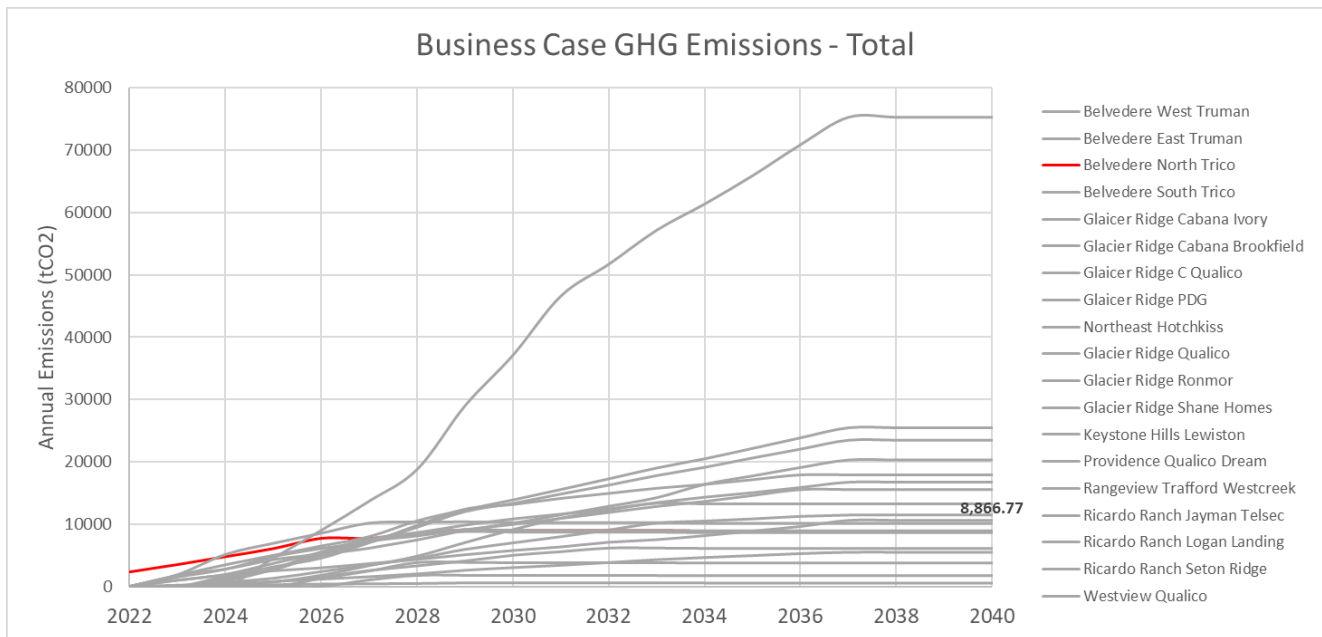
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

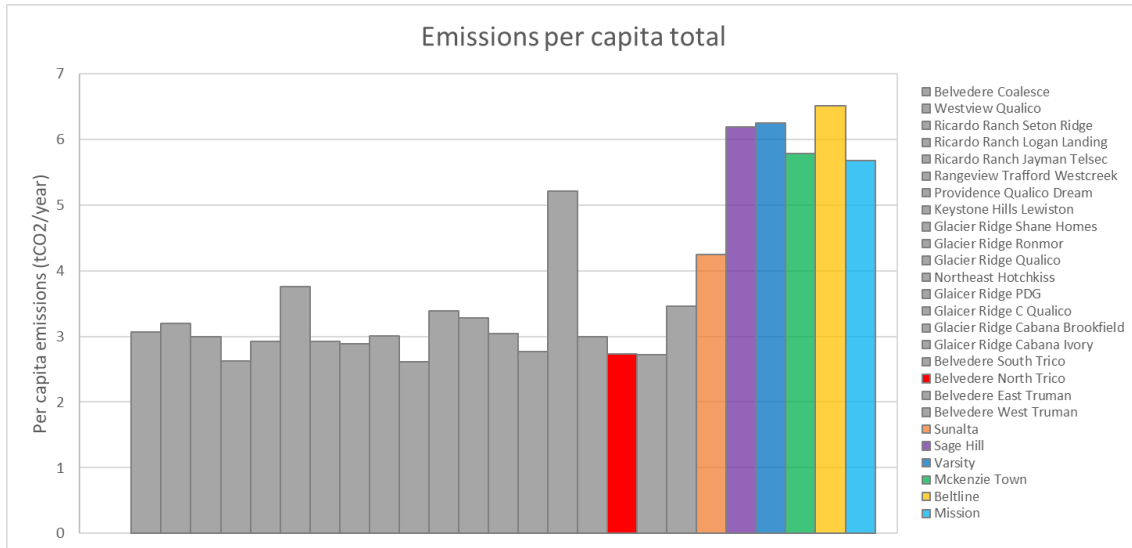


Airport travel is the largest contributors to amenity/work-based travel emissions at Belvedere North Trico. At full build out, Belvedere North Trico has an emission per capita from transportation of 1.18 tCO2 and annual emissions are forecasted to be 3,850.66 tCO2/year.

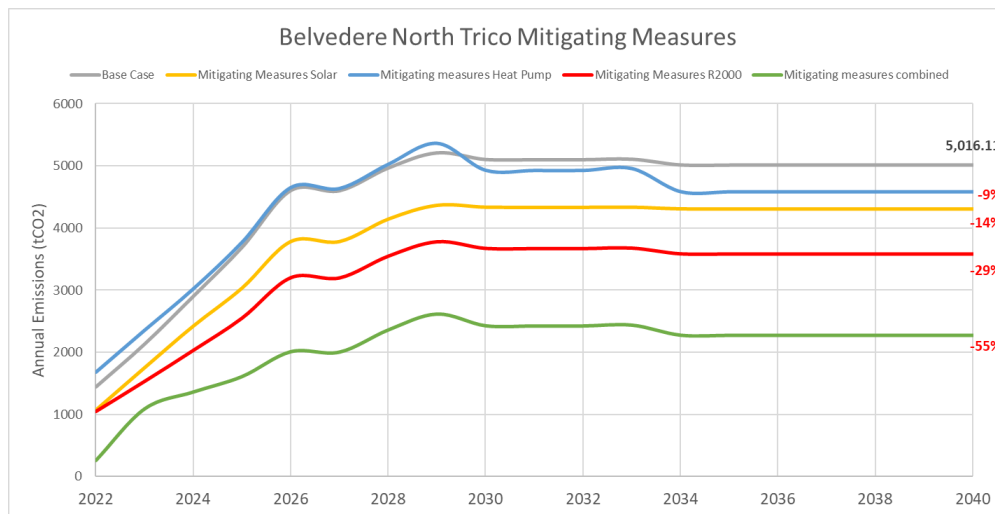
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 8,866.77 tCO2/year and 2.73 tCO2/capita at full build out. Estimated population at full build out is ~3250 people.





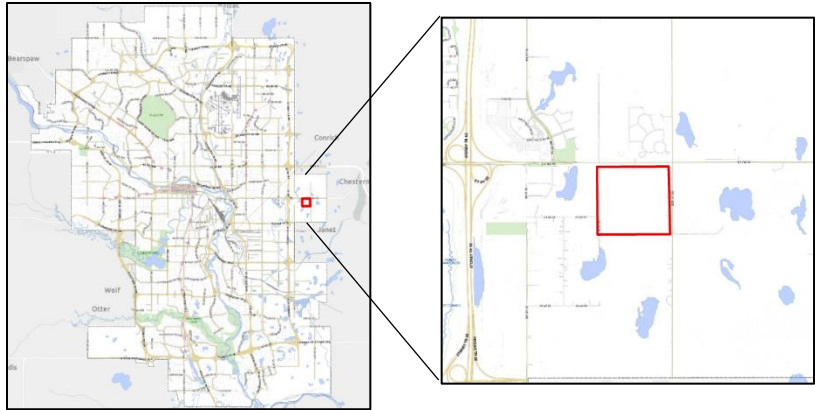
Mitigating measures - Buildings



Emissions from Belvedere North Trico can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation).

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 14% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 9% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 29% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 55%** from baseline, taking building emissions from 5,016.11 tCO₂/year to 2,268.48 tCO₂/year.



Belvedere South Trico is a mixed residential development situated in the east of the city that is planned to begin construction in the year 2026.

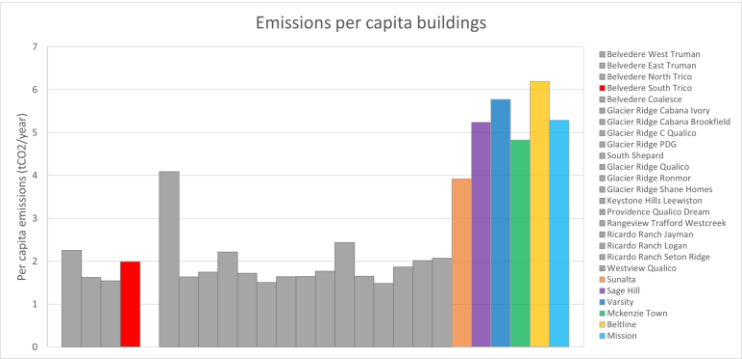
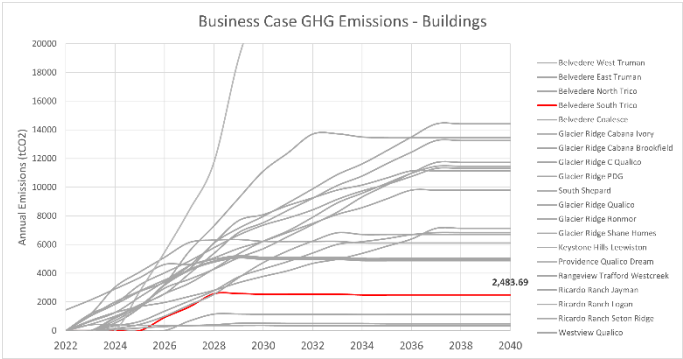
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Single Family	0	0	0	0	160	40	160	0	0	0	0	0	0	0	0	0	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	0	0	120	0	0	0	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*Diverse housing offering stated, therefore assumes 25% of builds are townhomes

Greenhouse Gas emissions – Buildings

What we heard: The proponent will, consider passive solar gain and solar and cogeneration units in the future (no timeline given)

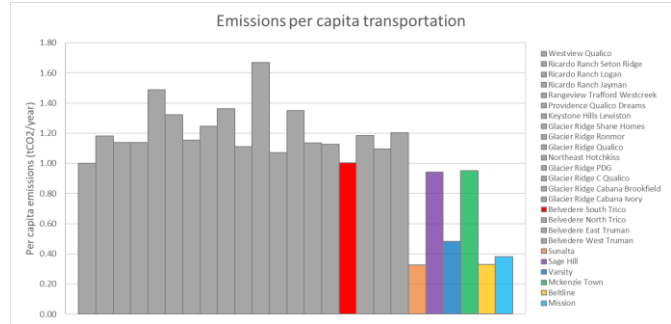
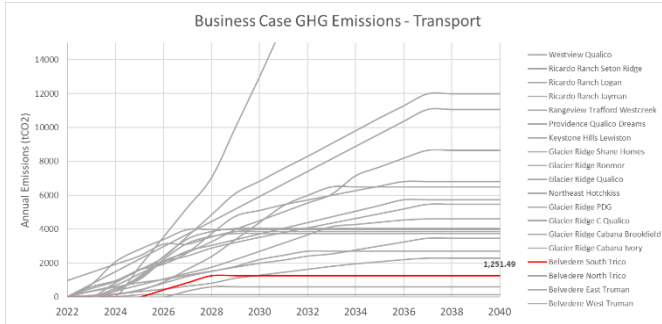


*Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040

At full build out, annual emissions from the operations of buildings at Belvedere South Trico are forecasted to be 2,483.69 tCO2/year, this equates to an emission per capita of 1.99 tCO2 at full build out. Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.

Greenhouse Gas emissions – Transportation

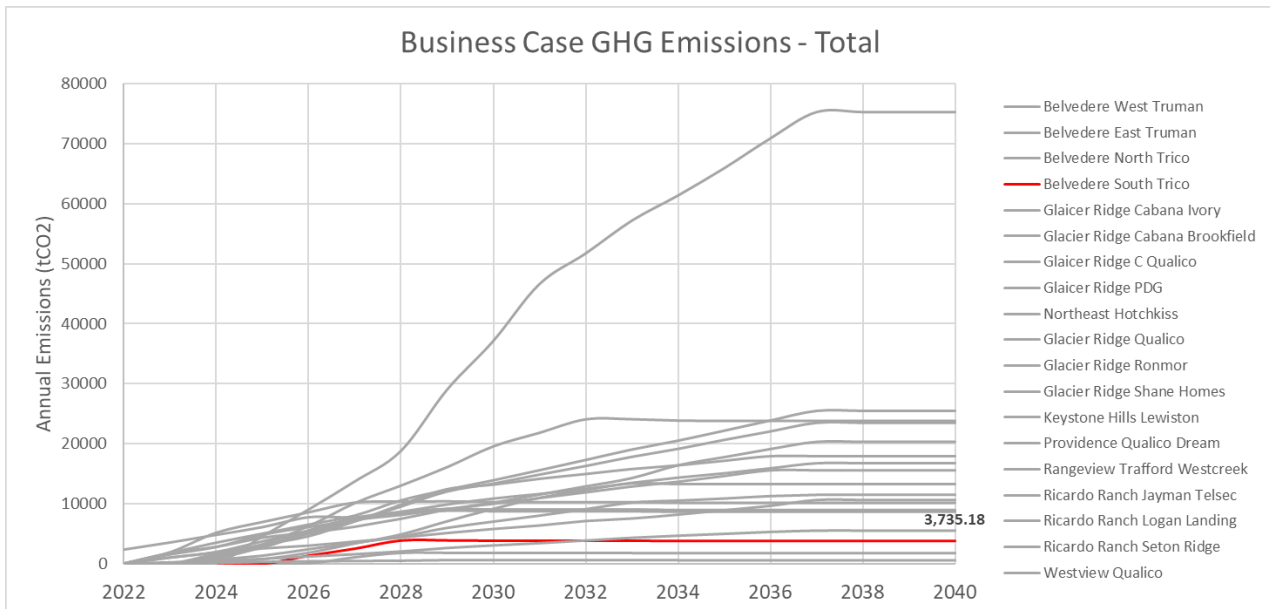
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities, and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

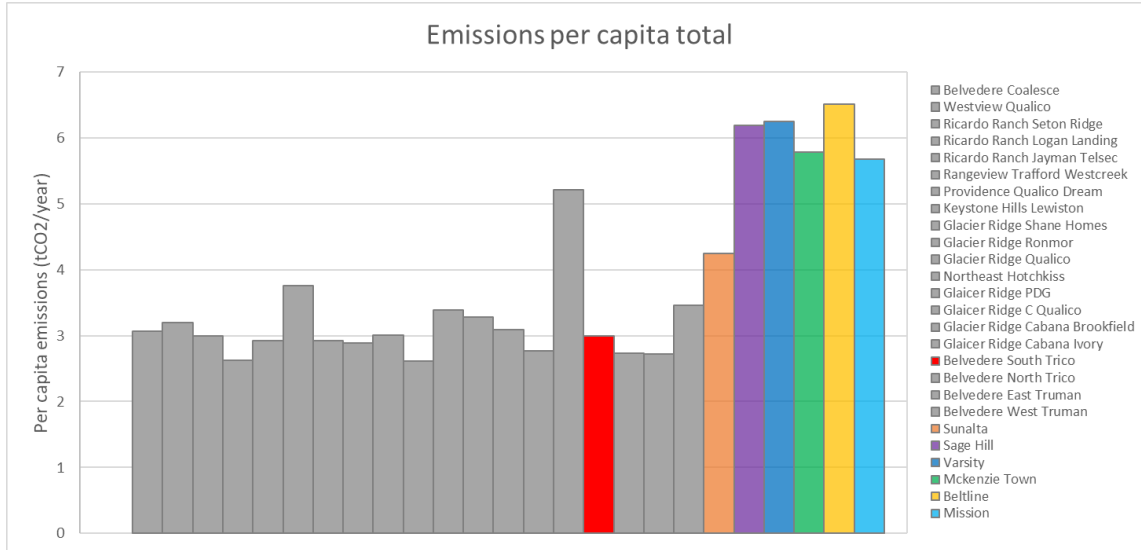


Airport travel is the largest contributors to amenity/work-based travel emissions at Belvedere South Trico. At full build out, Belvedere South Trico has an emission per capita from transportation of 1.00 tCO2 and annual emissions are forecasted to be 1,251.49 tCO2/year.

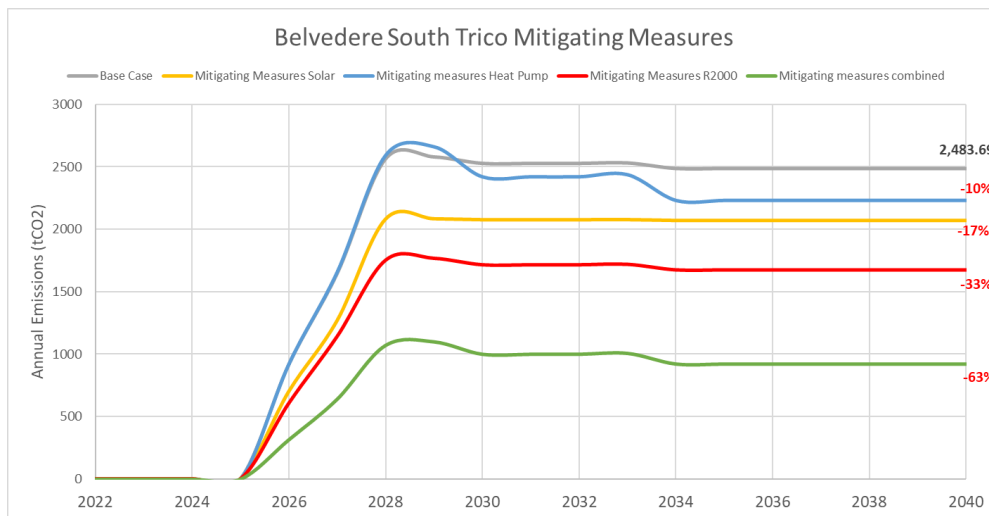
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 3,735.18 tCO2/year and 2.99 tCO2/capita at full build out. Estimated population at full build out is ~1250 people.





Mitigating measures - Buildings



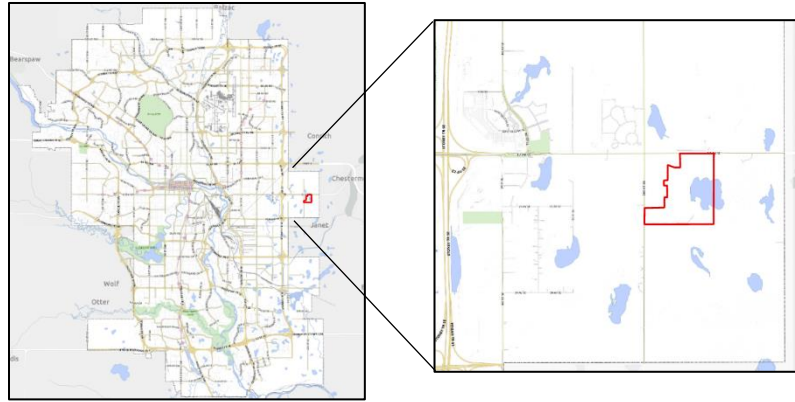
Emissions from Belvedere South Trico can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation).

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 17% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 10% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 33% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 63%** from baseline, taking building emissions from 2,483.69 tCO₂/year to 919.40 tCO₂/year.



Belvedere East Truman – Greenhouse Gas Emissions Analysis



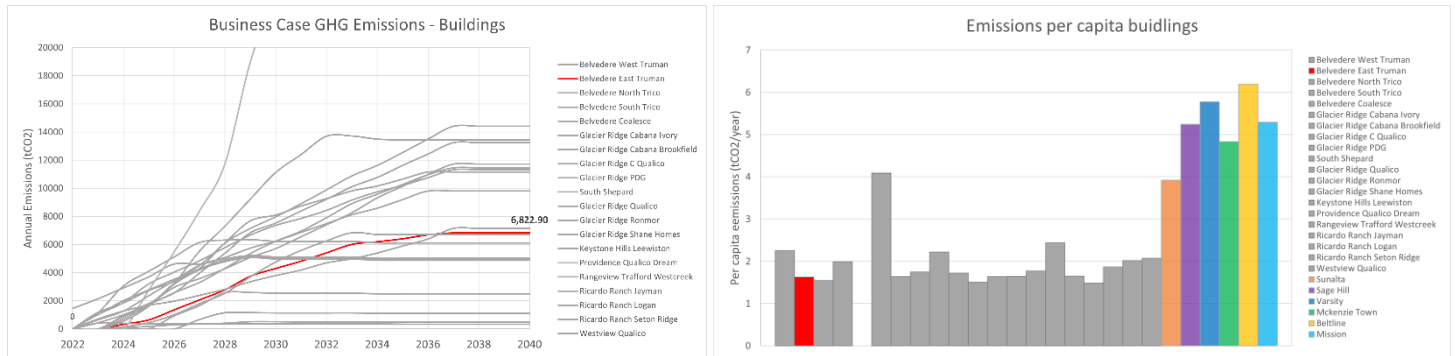
Belvedere East Truman is a mixed development situated in the east of the city that is planned to begin construction in the year 2024.

Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	135	133	133	133	133	133	133	133	134	134	0	0	0	0	0	0	0
Single Family	0	0	0	0	0	0	0	40	50	50	50	50	50	50	50	25	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	0	0	62700	62700	62700	62700	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Greenhouse Gas emissions – Buildings

What we heard: The proponent will, use energy efficiency strategies aligned with the National Energy Code for Buildings.

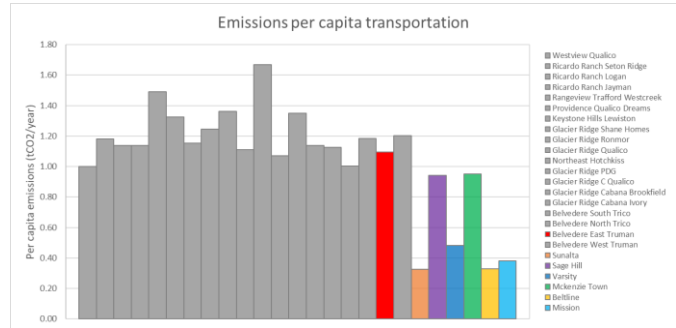
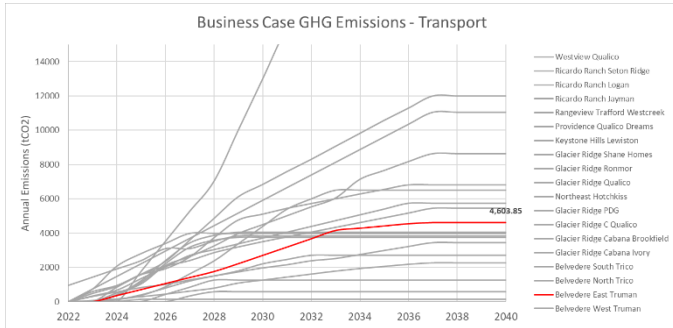


**Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040*

At full build out, annual emissions from the operations of buildings at Belvedere East Truman are forecasted to be 6,822.90 tCO₂/year, this equates to an emission per capita of 1.62 tCO₂ at full build out. *Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.*

Greenhouse Gas emissions – Transportation

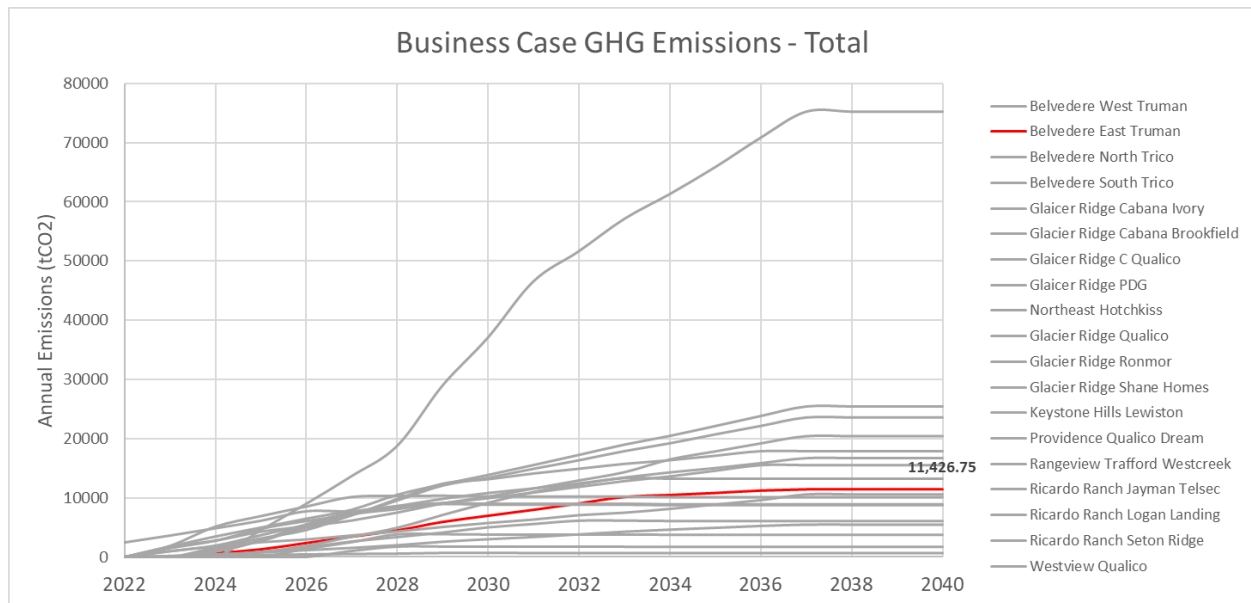
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

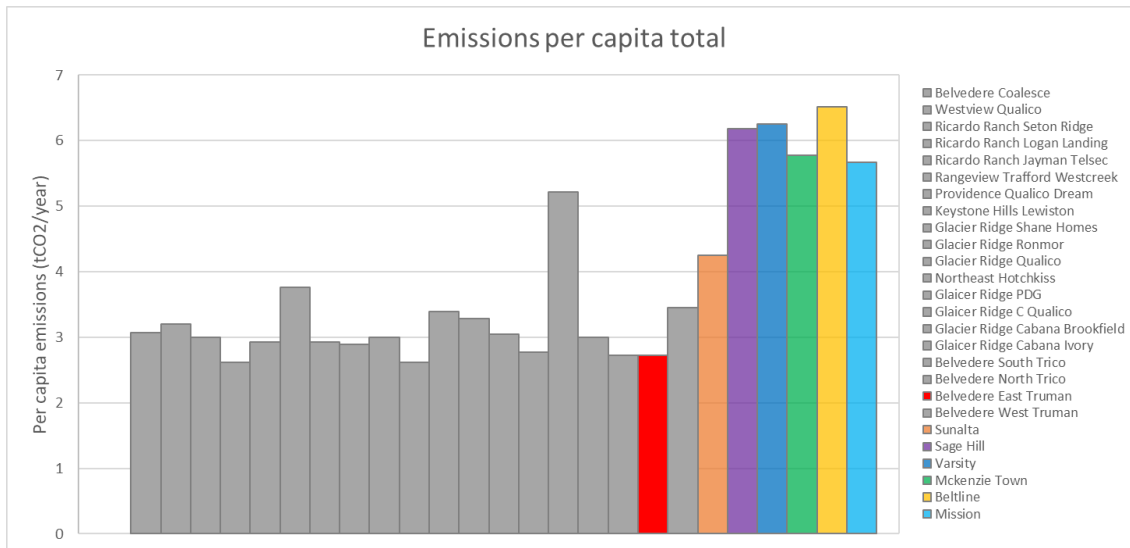


Airport travel are the largest contributors to amenity/work-based travel emissions at Belvedere East Truman. At full build out, Belvedere East Truman has an emission per capita from transportation of 1.10 tCO2 and annual emissions are forecasted to be 4,603.85 tCO2/year.

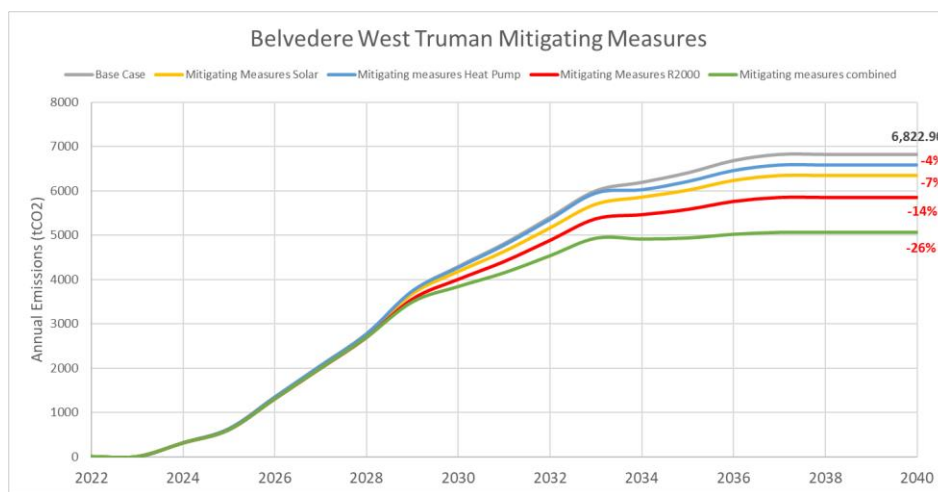
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 11,426.75 tCO2/year and 2.72 tCO2/capita at full build out. Estimated population at full build out is ~4200 people.





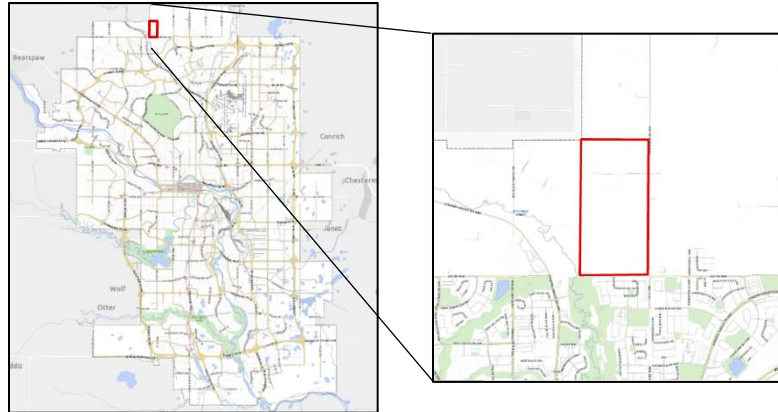
Mitigating measures - Buildings



Emissions from Belvedere West can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (Mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation).

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 7% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 4% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 14% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 26%** from baseline, taking building emissions from 6,822.90 tCO₂/year to 5056.788 tCO₂/year.



Glacier Ridge Community C Qualico is a mixed-use development situated in the north-west quadrant of the city that is planned to begin construction in the year 2024.

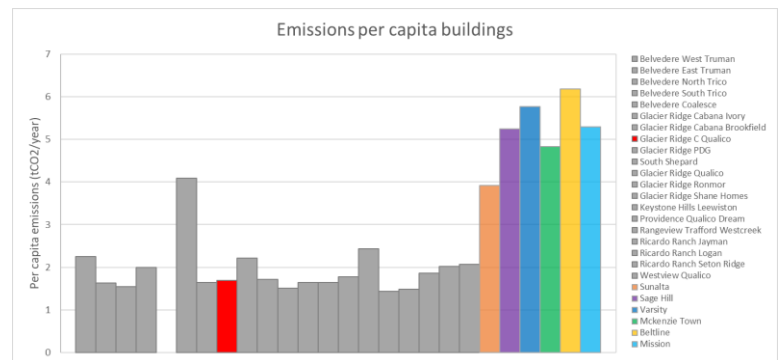
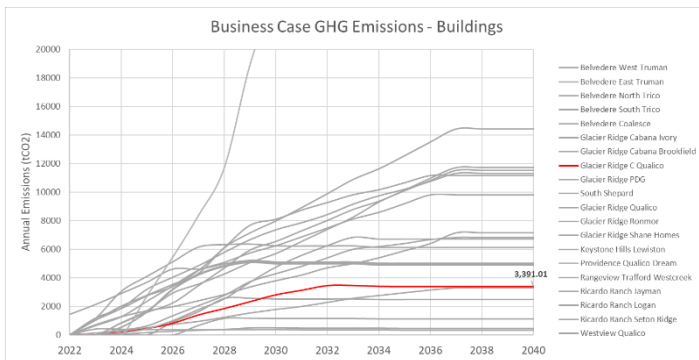
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	3	7	7	10	13	13	10	3	0	0	0	0	0	0	0	0	0
Single Family	0	0	29	0	0	88	58	58	88	58	58	0	0	0	0	0	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	59	88	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	10873	16309	21745	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*Diverse housing offering stated, therefore assumes 25% of builds are townhomes

Greenhouse Gas emissions – Buildings

What we heard: The proponent will offer: solar panels, tankless water heaters, above-code insulation, high efficiency furnaces, smart thermostats, heat recovery ventilators and triple pane windows (no standard given)

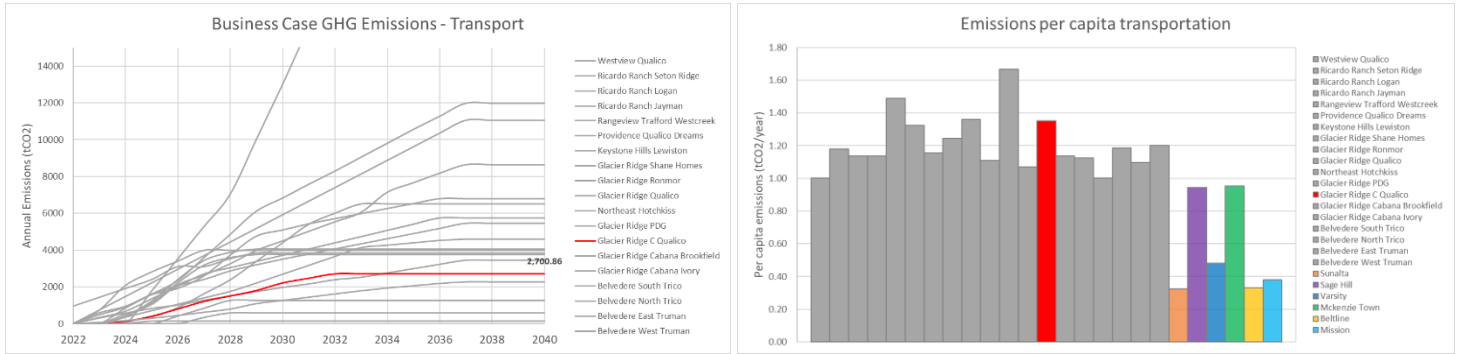


*Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040

At full build out, annual emissions from the operations of buildings at Glacier Ridge Community C Qualico are forecasted to be 3,391.01 tCO2/year, this equates to an emission per capita of 1.70 tCO2 at full build out. Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.

Greenhouse Gas emissions – Transportation

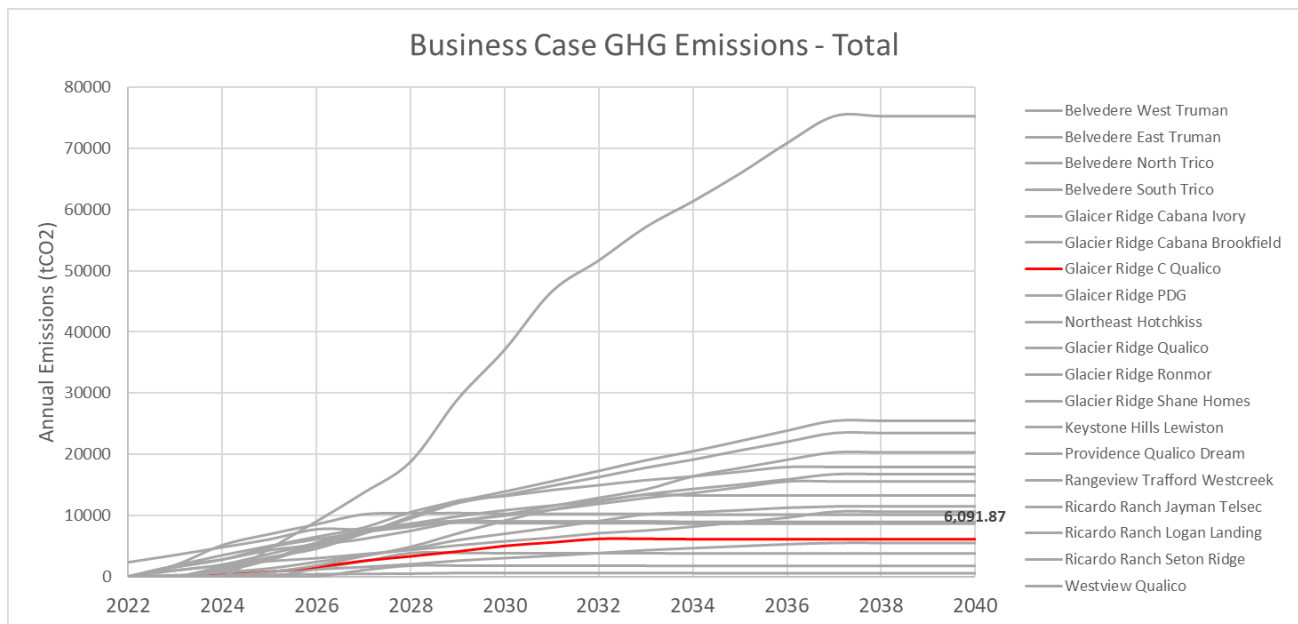
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

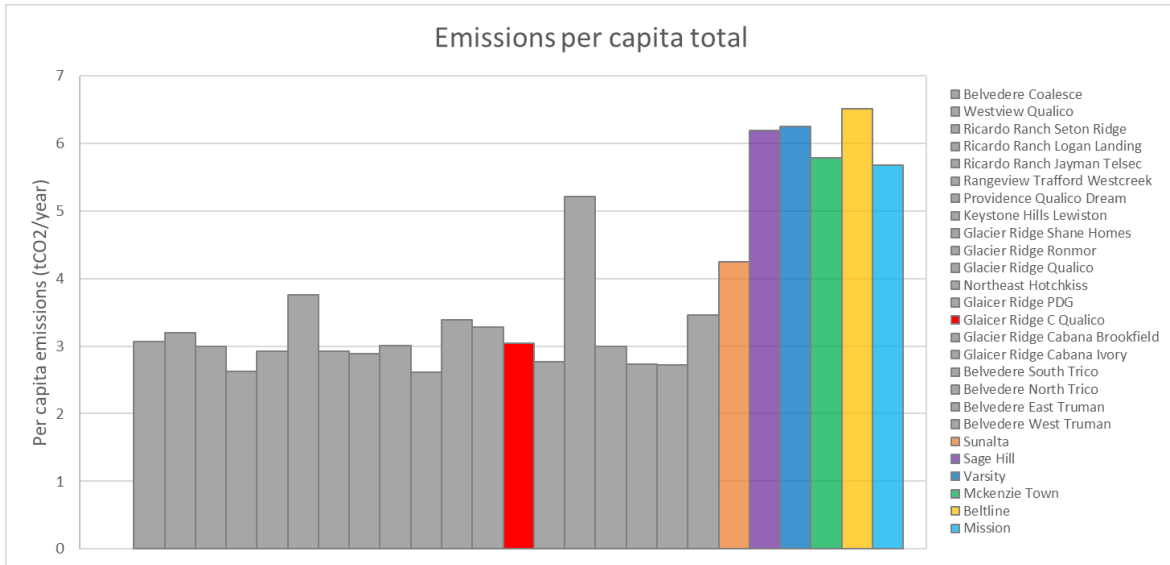


Downtown, health service and airport travel are the largest contributors to amenity/work-based travel emissions at Glacier Ridge Community C Qualico. At full build out, Glacier Ridge Community C Qualico has an emission per capita from transportation of 1.35 tCO2 and annual emissions are forecasted to be 2,700.86 tCO2/year.

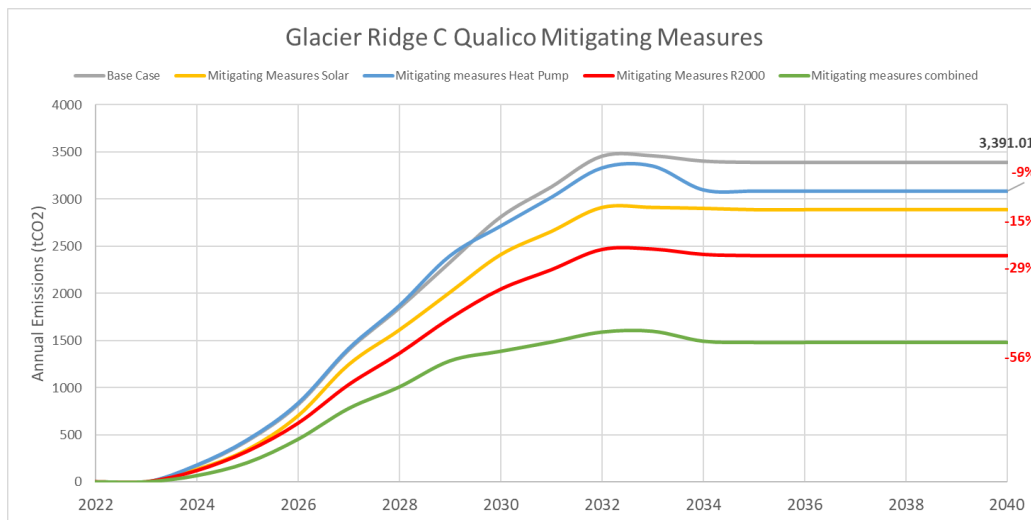
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 6,091.9 tCO2/year and 3.05 tCO2/capita at full build out. Estimated population at full build out is ~2000 people.





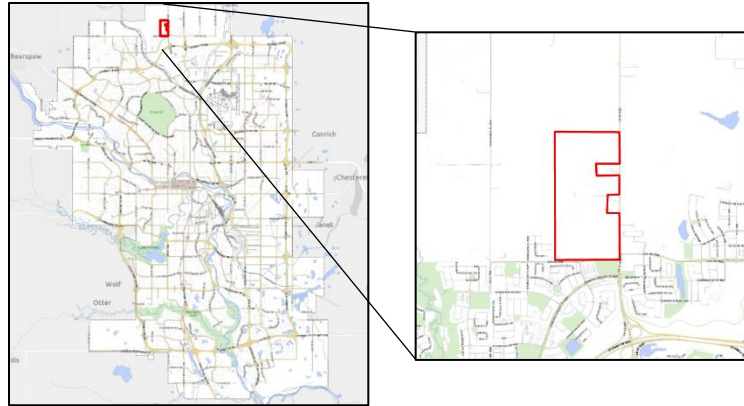
Mitigating measures – Buildings



Emissions from Glacier Ridge Community C Qualico can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation)

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 15% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 9% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 29% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 56%** from baseline, taking building emissions from 3,391.09 tCO2/year to 1,481.86 tCO2/year.



Glacier Ridge Cabana Brookfield is a mixed-use development situated in the north-west quadrant of the city that is planned to begin construction in the year 2023.

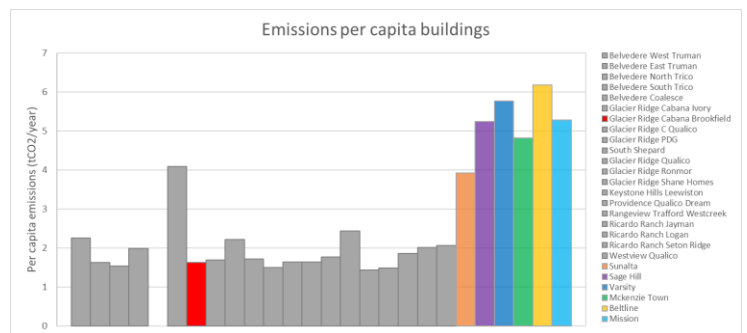
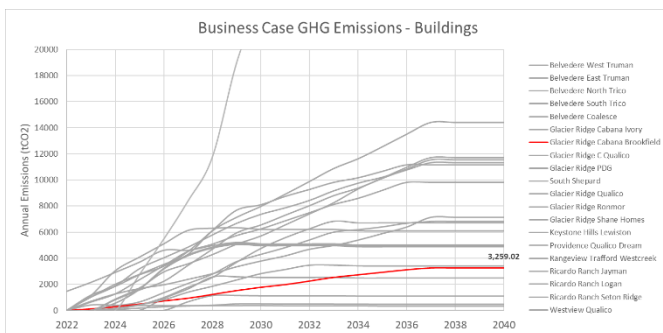
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	0	0	0	0	0	34	0	0	0	0	0	0	0	0	0	0	0
Single Family	0	21	28	36	43	0	50	0	50	0	38	50	43	35	35	25	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	0	0	50	0	50	0	50	12	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	0	0	0	0	0	1424	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Diverse housing offering stated, therefore assumes 25% of builds are townhomes*

Greenhouse Gas emissions – Buildings

What we heard: The proponent will consider EV charging stations and solar panels

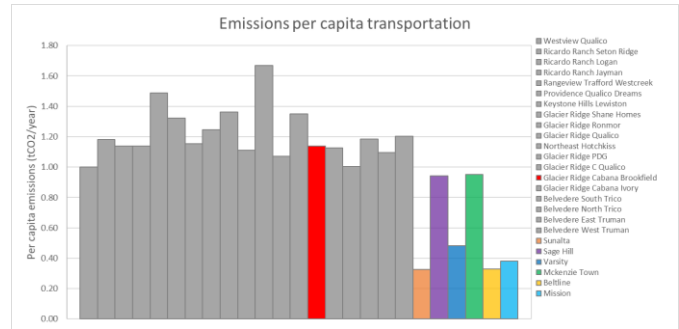
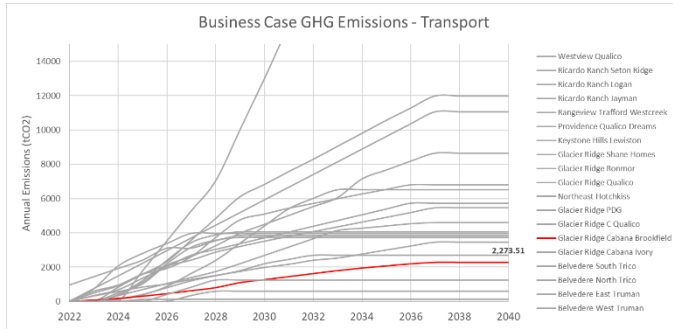


**Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040*

At full build out, annual emissions from the operations of buildings at Glacier Ridge Cabana Brookfield are forecasted to be 3,259.02 tCO2/year, this equates to an emission per capita of 1.63tCO2 at full build out. *Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.*

Greenhouse Gas emissions – Transportation

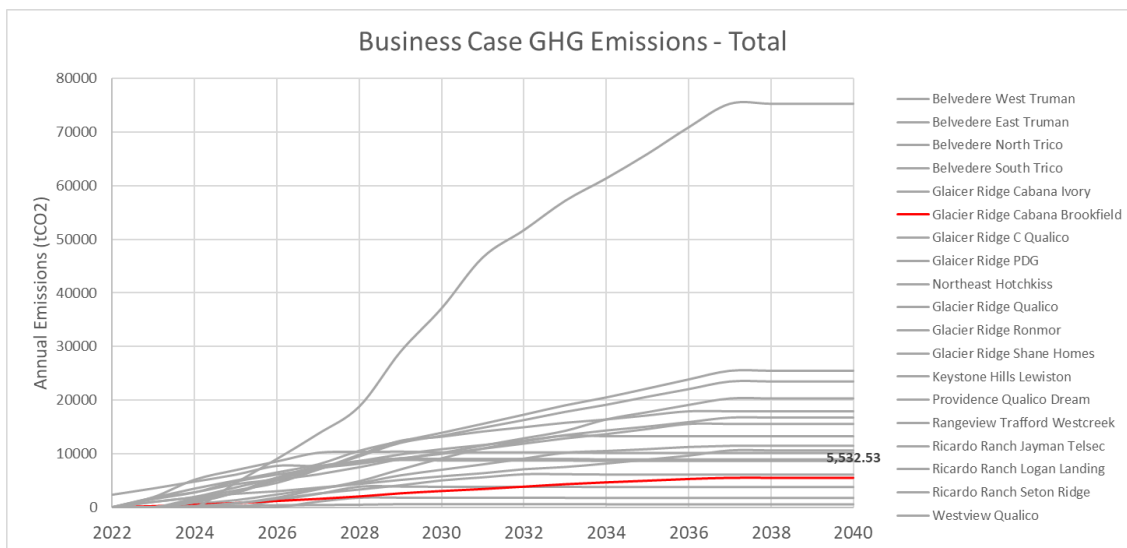
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

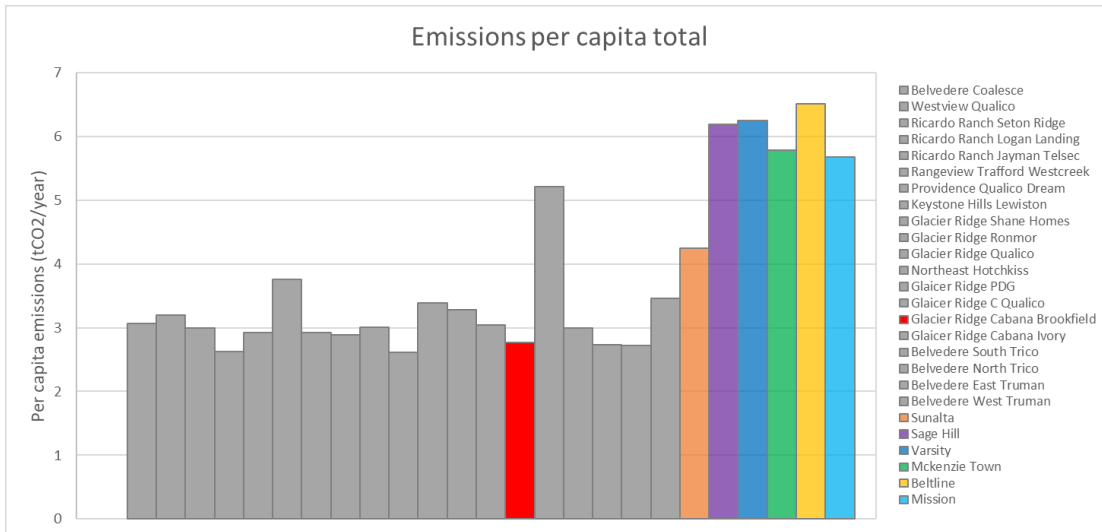


Downtown, health service and LRT travel are the largest contributors to amenity/work-based travel emissions at Glacier Ridge Cabana Brookfield. At full build out, Glacier Ridge Cabana Brookfield has an emission per capita from transportation of 1.14 tCO2 and annual emissions are forecasted to be 2,273.51 tCO2/year.

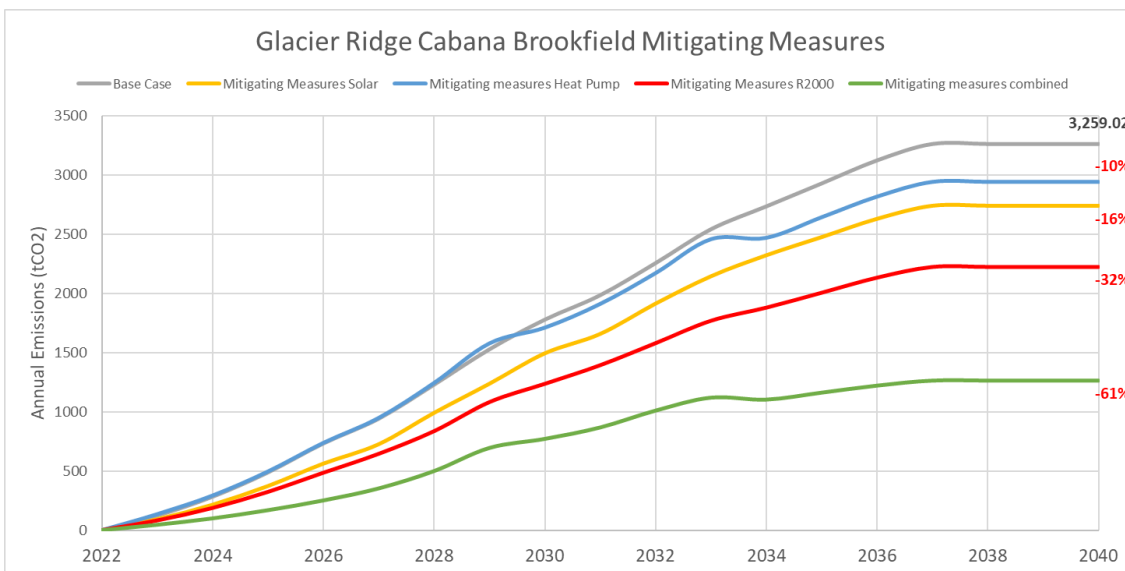
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 5,532.5 tCO2/year and 2.77 tCO2/capita at full build out. Estimated population at full build out is ~2000 people.





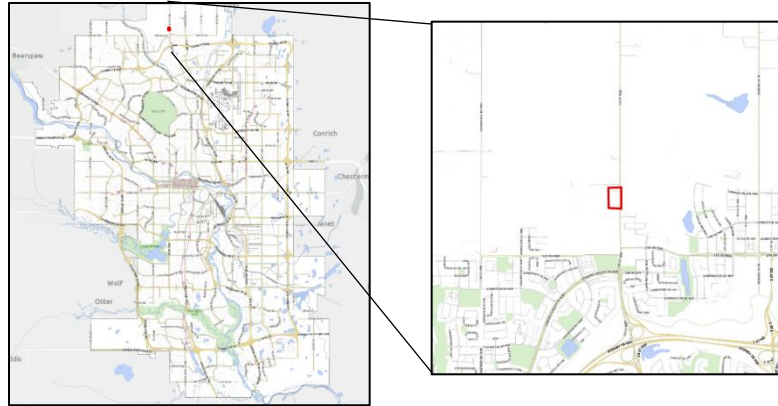
Mitigating measures - buildings



Emissions from Glacier Ridge Cabana Brookfield can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: heat pump technology, solar PV and improved energy performance to R2000 standard (mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation)

- Switching natural gas fired heating systems to heat pump technology could result in a 10% reduction in emissions.
- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 16% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 32% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 61%** from baseline, taking building emissions from 3,259.02 tCO2/year to 1,266.21 tCO2/year.



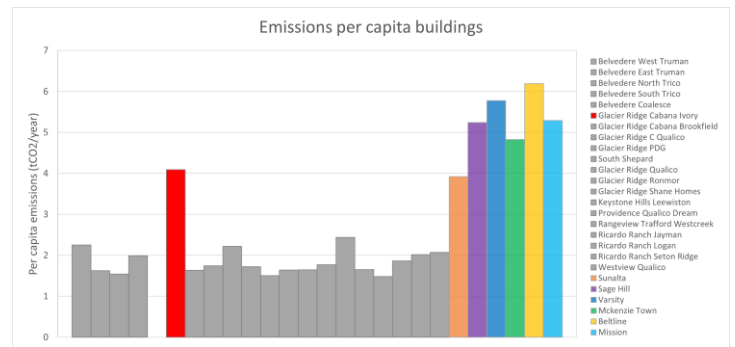
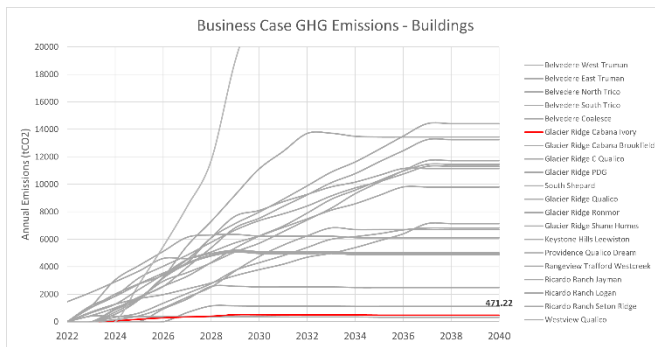
Glacier Ridge Cabana Ivory is a mixed-use development situated in the north-west of the city that is planned to begin construction in the year 2024.

Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	6	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Single Family	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	0	11000	0	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	6600	3300	16200	10000	0	16500	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Greenhouse Gas emissions – Buildings

What we heard: The proponent will consider EV charging stations and solar panels

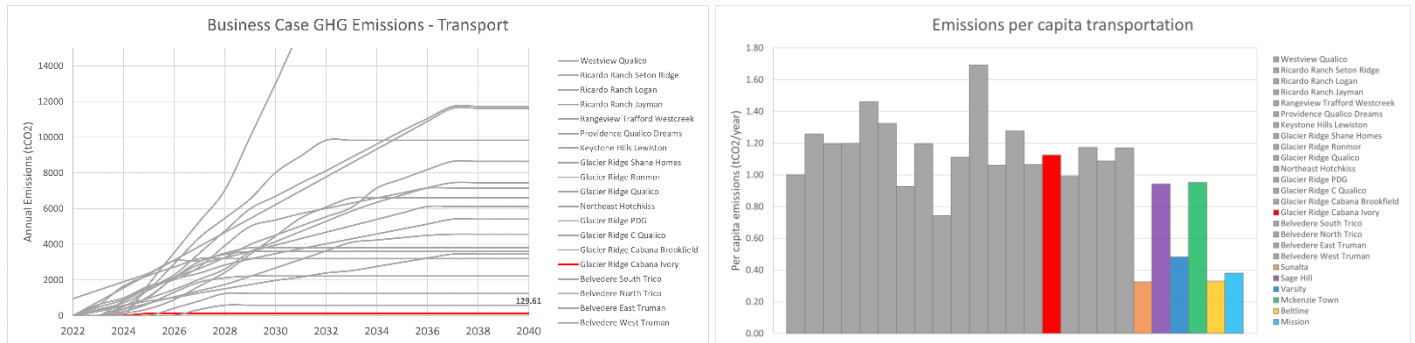


**Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040*

At full build out, annual emissions from the operations of buildings at Glacier Ridge Cabana Ivory are forecasted to be 471.22 tCO2/year, this equates to an emission per capita of 4.09 tCO2 at full build out. Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.

Greenhouse Gas emissions – Transportation

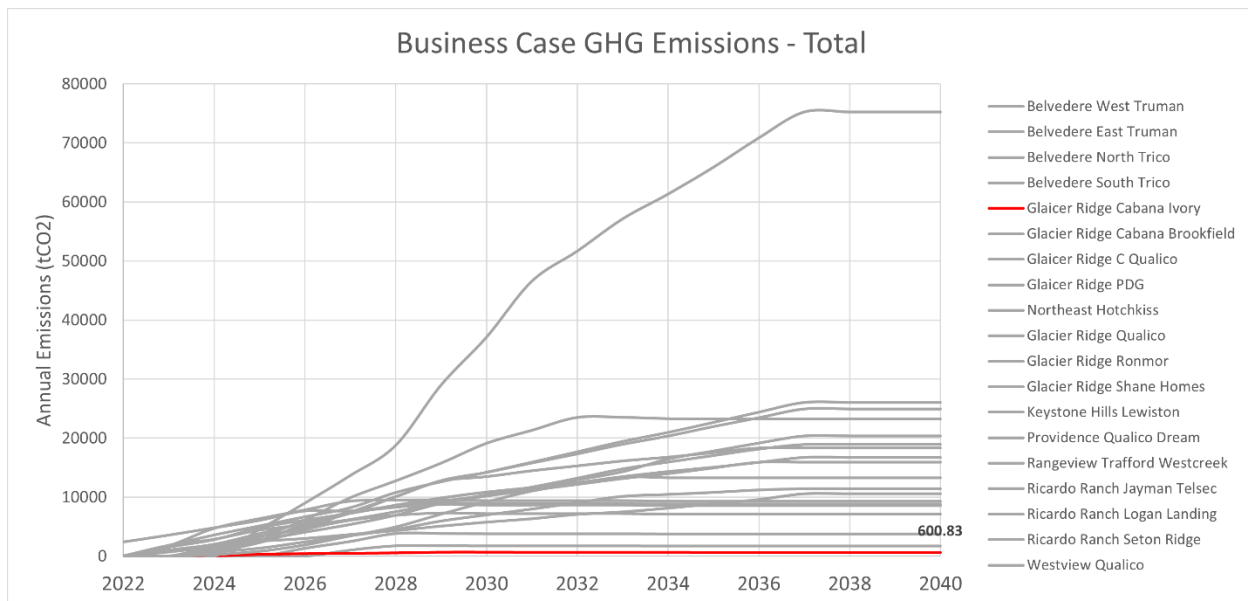
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

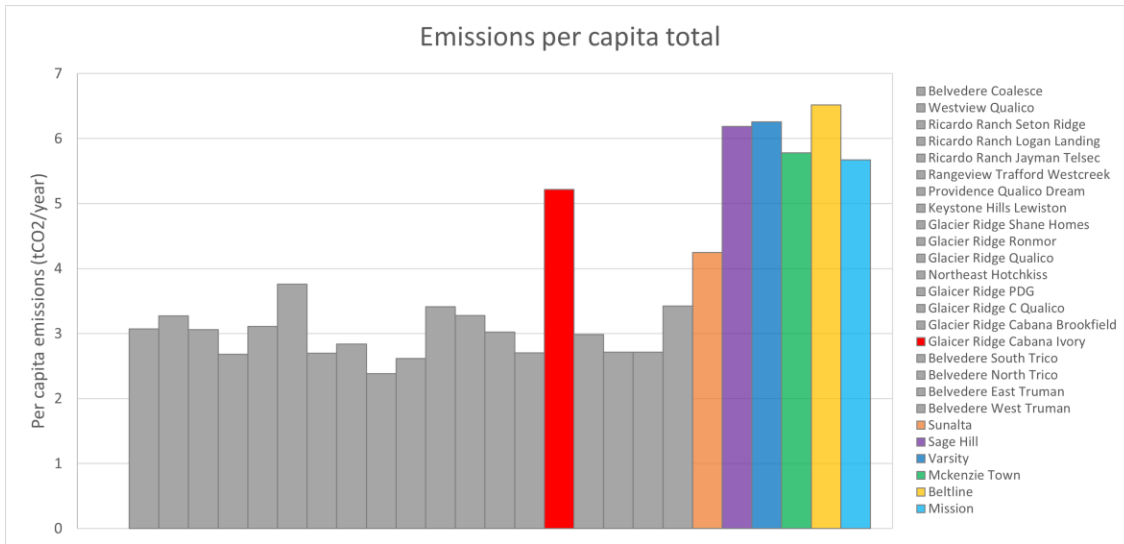


Downtown, health service and LRT travel are the largest contributors to amenity/work-based travel emissions at Glacier Ridge Cabana Ivory. At full build out, Glacier Ridge Cabana Ivory has an emission per capita from transportation of 1.13 tCO2 and annual emissions are forecasted to be 129.61 tCO2/year.

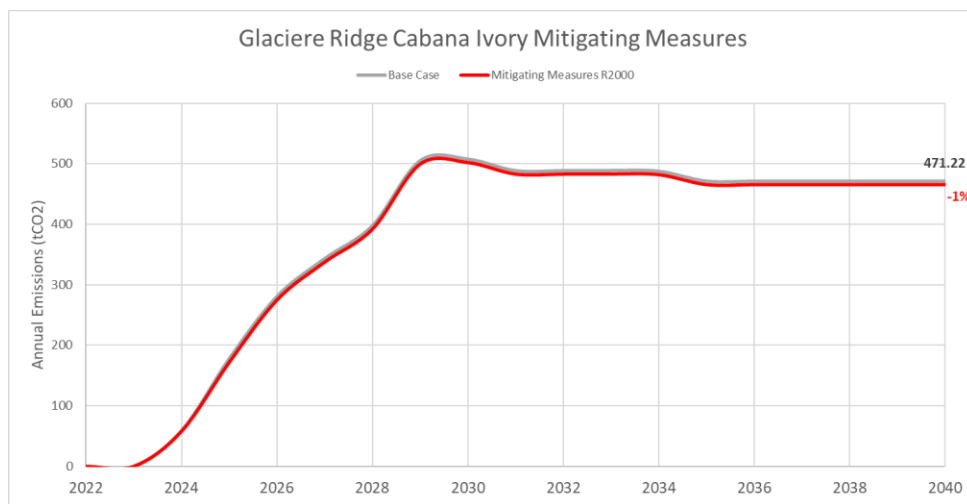
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 600.83 tCO2/year and 5.22 tCO2/capita at full build out. Estimated population at full build out is ~115 people.





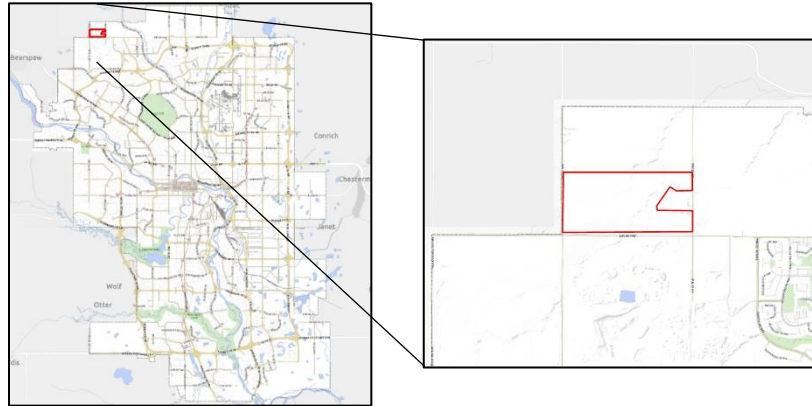
Mitigating measures - Buildings



Emissions from Glacier Ridge Cabana Ivory can be mitigated and reduced if clean technology options are adopted, the graph above shows the emissions impact of adopting improved energy performance to R2000 standard (Similarly, transportation mitigating measures are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation).

- Improving the energy performance standard to align with the R2000 standard could result in a 1% reduction in emissions

Other emissions mitigation options e.g. the installation of solar panels is not displayed here, as The City of Calgary is still developing data for the quantification of solar potential of multi-unit residential, commercial and industrial buildings.



Glacier Ridge Partners Development Group (PDG) is a mixed-use development situated in the north-west quadrant of the city that is planned to begin construction in the year 2023.

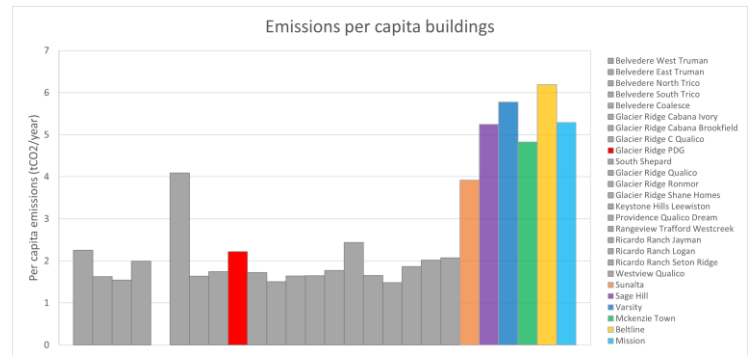
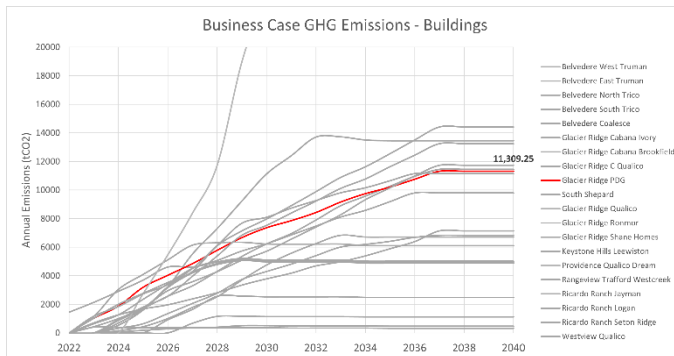
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	0	100	50	0	46	0	0	0	0	0	0	0	0	0	0	0	0
Single Family	0	175	150	150	0	60	58	120	110	0	0	100	100	100	100	101	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	0	120	60	62	0	0	100	100	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	0	0	0	0	0
Retail (sq.ft)	0	0	0	10000	10000	10000	10000	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*Diverse housing offering stated, therefore assumes 25% of builds are townhomes

Greenhouse Gas emissions – Buildings

What we heard: The proponent will develop to maximize passive solar gain, make homes solar ready, and explore addition of green roof/cool roof.

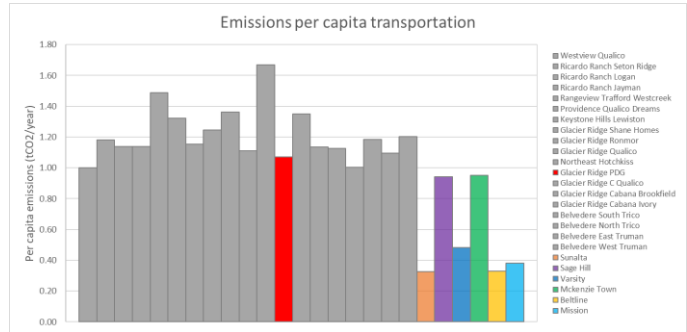
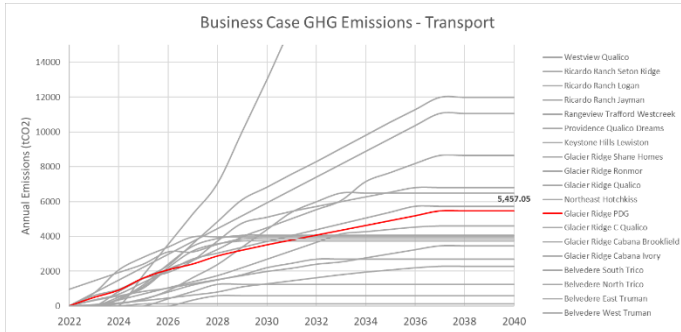


*Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040

At full build out, annual emissions from the operations of buildings at Glacier Ridge PDG are forecasted to be 11,309.25 tCO₂/year, this equates to an emission per capita of 2.22 tCO₂ at full build out. *Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.*

Greenhouse Gas emissions – Transportation

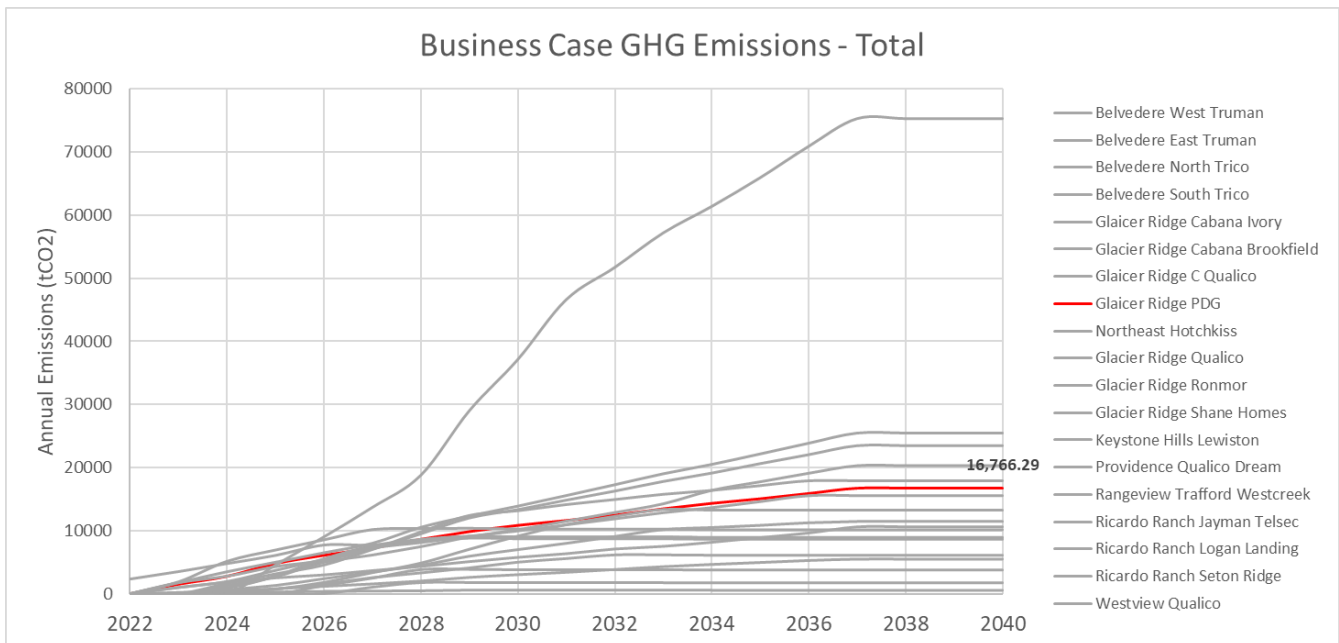
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

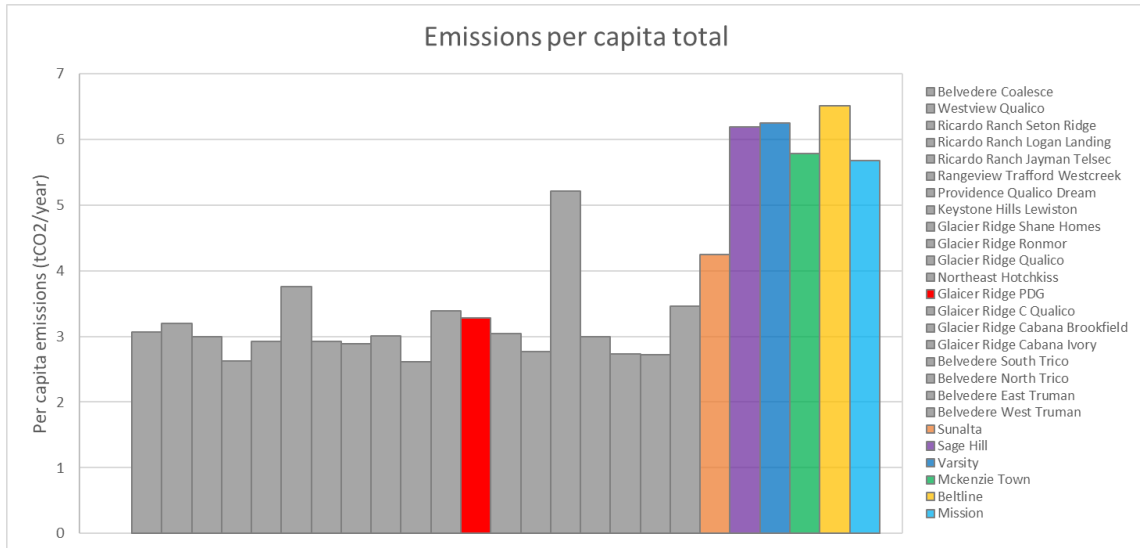


Downtown, health service and airport travel are the largest contributors to amenity/work-based travel emissions at Glacier Ridge PDG. At full build out, Glacier Ridge PDG has an emission per capita from transportation of 1.07 tCO2 and annual emissions are forecasted to be 5,457.05 tCO2/year.

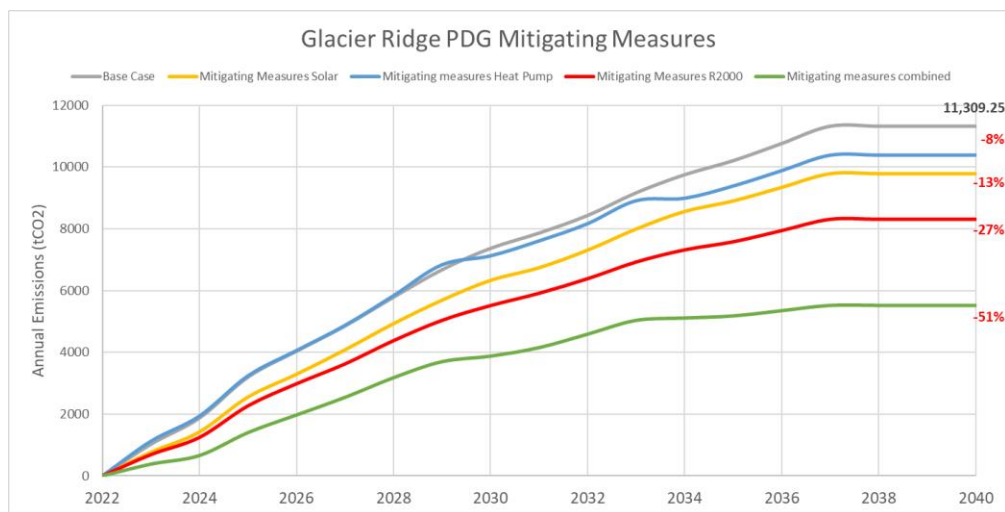
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 16,766.29 tCO2/year and 3.29 tCO2/capita at full build out. Estimated population at full build out is ~5100 people.





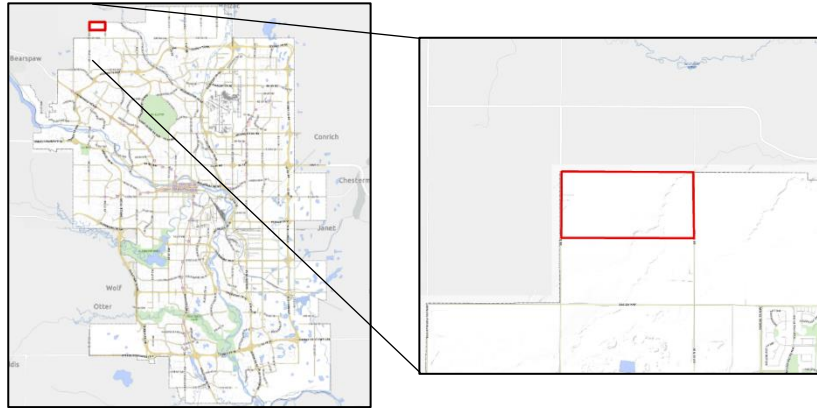
Mitigating measures - Buildings



Emissions from Glacier Ridge PDG can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation).

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 13% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 8% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 27% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 51%** from baseline, taking building emissions from 11,309.25 tCO₂/year to 5,530.51 tCO₂/year.



Glacier Ridge Qualico is a mixed residential development situated in the north-west quadrant of the city that is planned to begin construction in the year 2024.

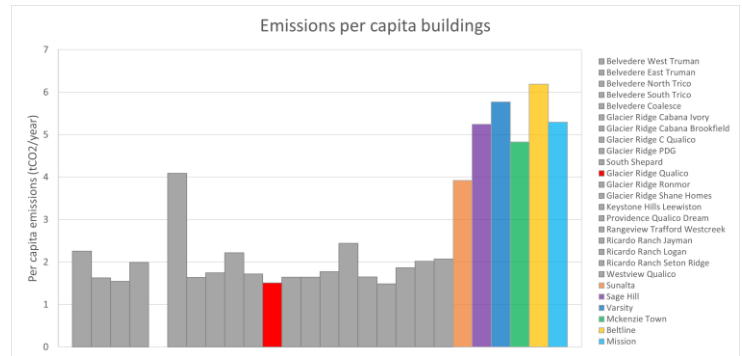
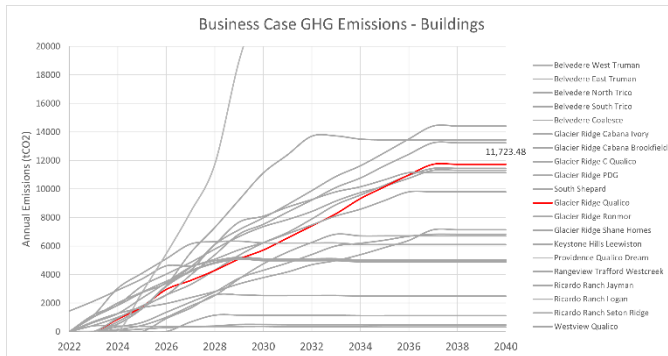
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	0	0	160	0	30	60	0	0	0	0	164	0	0	0	0	0	0
Single Family	0	0	150	150	150	0	0	0	79	150	150	150	150	150	150	134	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	0	0	150	150	150	71	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*Diverse housing offering stated, therefore assumes 25% of builds are townhomes

Greenhouse Gas emissions – Buildings

What we heard: Solar panels, tankless water heaters, above-code insulation, high efficiency furnaces, smart thermostats, heat recovery ventilators and triple pane windows are optional.

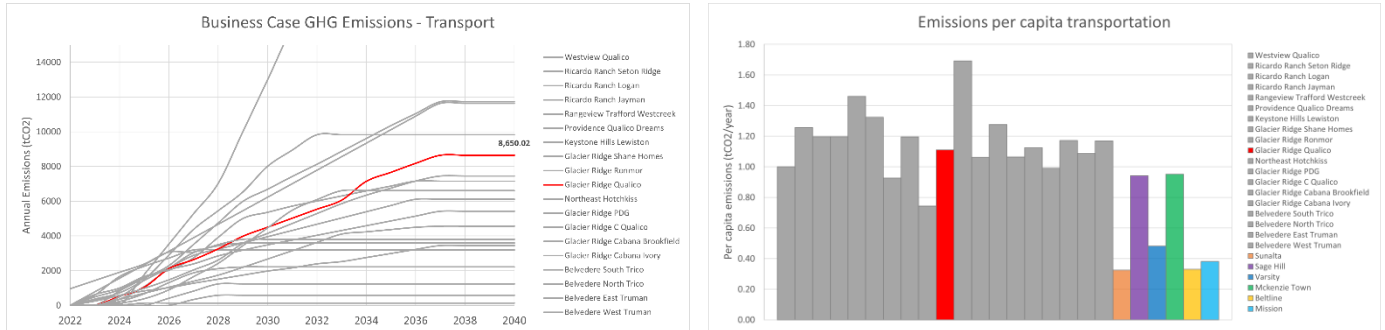


*Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040

At full build out, annual emissions from the operations of buildings at Glacier Ridge Qualico are forecasted to be 11,723.48 tCO2/year, this equates to an emission per capita of 1.51 tCO2 at full build out. Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.

Greenhouse Gas emissions – Transportation

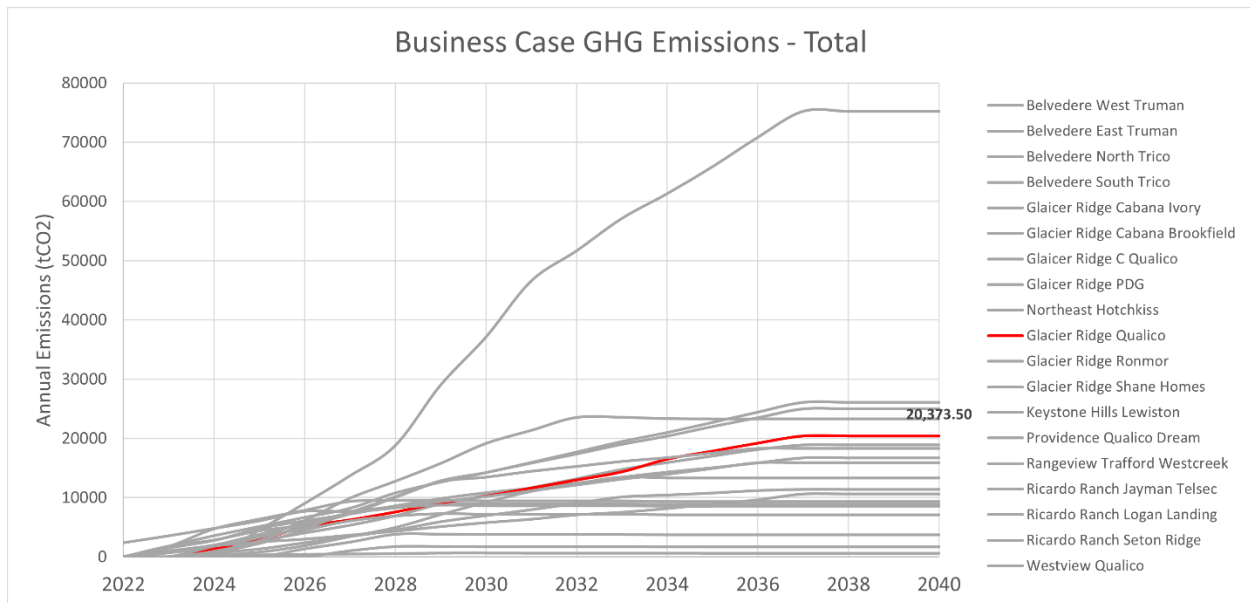
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

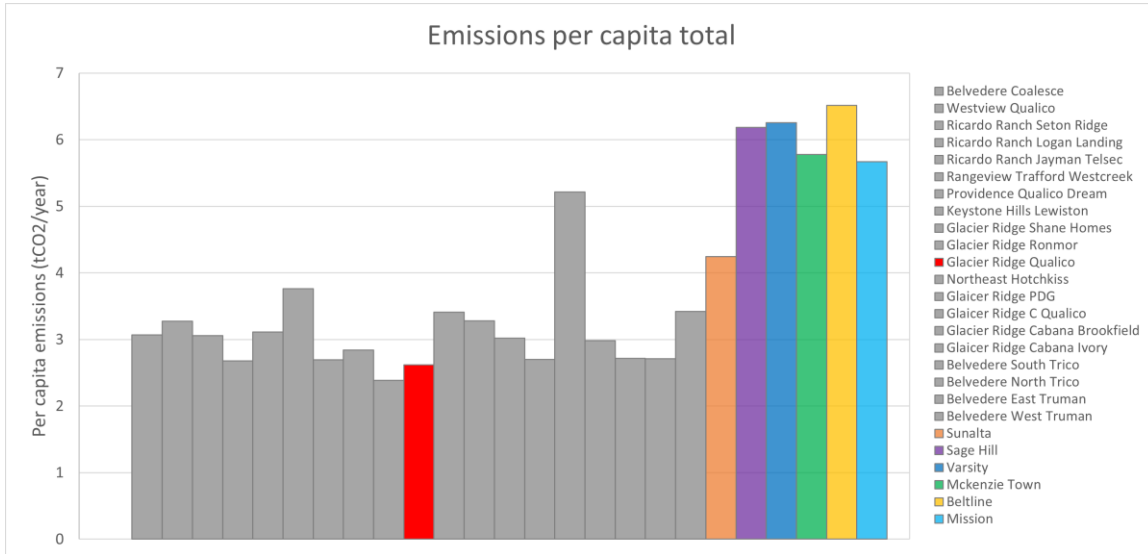


Downtown, health service and airport travel are the largest contributors to amenity/work-based travel emissions at Glacier Ridge Qualico. At full build out, Glacier Ridge Qualico has an emission per capita from transportation of 1.11 tCO2 and annual emissions are forecasted to be 8,650.02 tCO2/year.

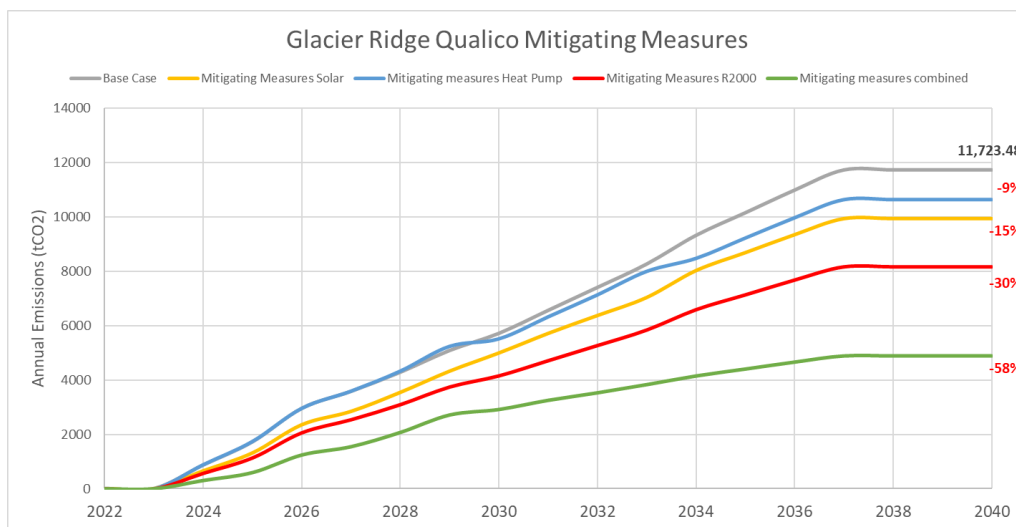
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 20,373.50 tCO2/year and 2.62 tCO2/capita at full build out. Estimated population at full build out is ~7790 people.





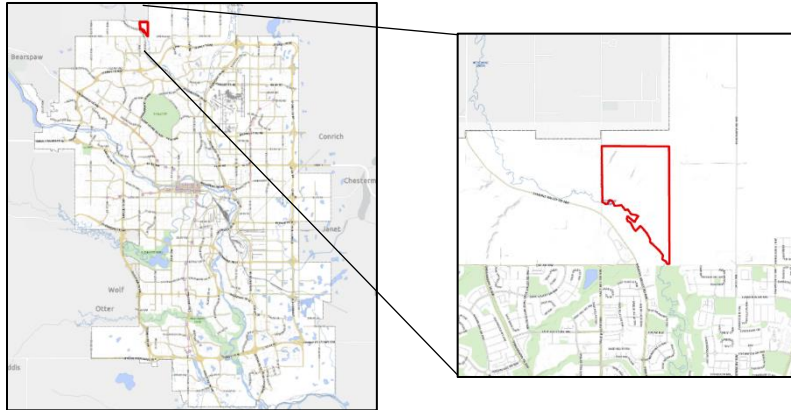
Mitigating measures - Buildings



Emissions from Glacier Ridge Qualico can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation).

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 15% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 9% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 30% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 58%** from baseline, taking building emissions from 11,723.48 tCO₂/year to 4,879.82 tCO₂/year.



Glacier Ridge Ronmor is a mixed-use development situated in the north west quadrant of the city that is planned to begin construction in the year 2024.

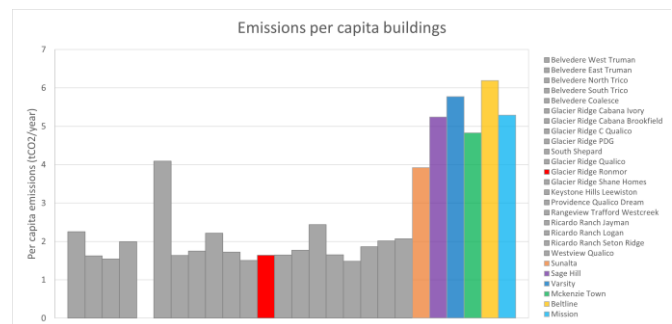
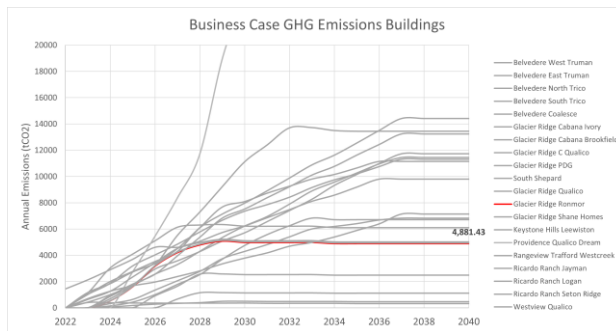
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	10	20	20	30	19	0	0	0	0	0	0	0	0	0	0	0	0
Single Family	0	0	89	178	267	0	89	45	0	0	0	0	0	0	0	0	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	0	0	223	0	0	0	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	5,167	5,167	0	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Diverse housing offering stated, therefore assumes 25% of builds are townhomes*

Greenhouse Gas emissions – Buildings

What we heard: Considering, electric vehicle charging, better performing fixtures and appliances that reduce energy and water consumption.

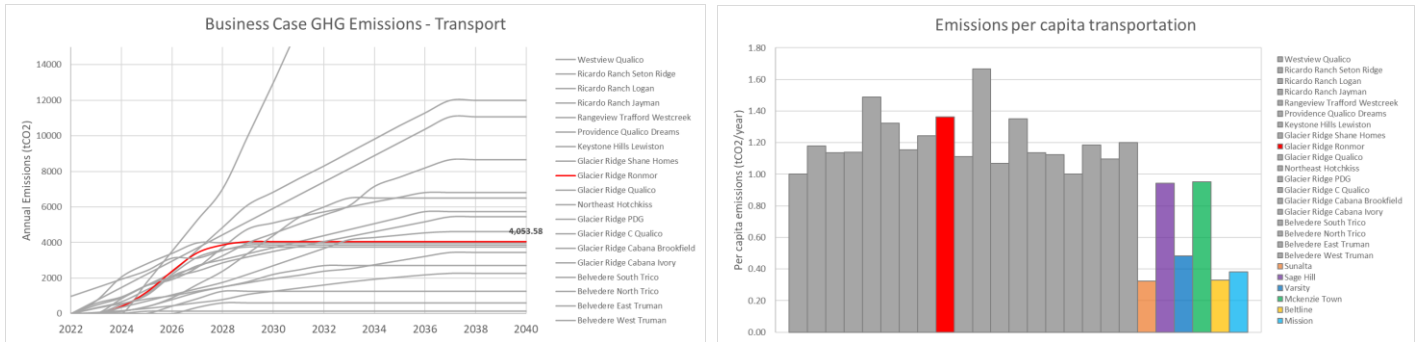


**Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040*

At full build out, annual emissions from the operations of buildings at Glacier Ridge Ronmor are forecasted to be 4,881.43 tCO2/year, this equates to an emission per capita of 1.64 tCO2 at full build out. *Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.*

Greenhouse Gas emissions – Transportation

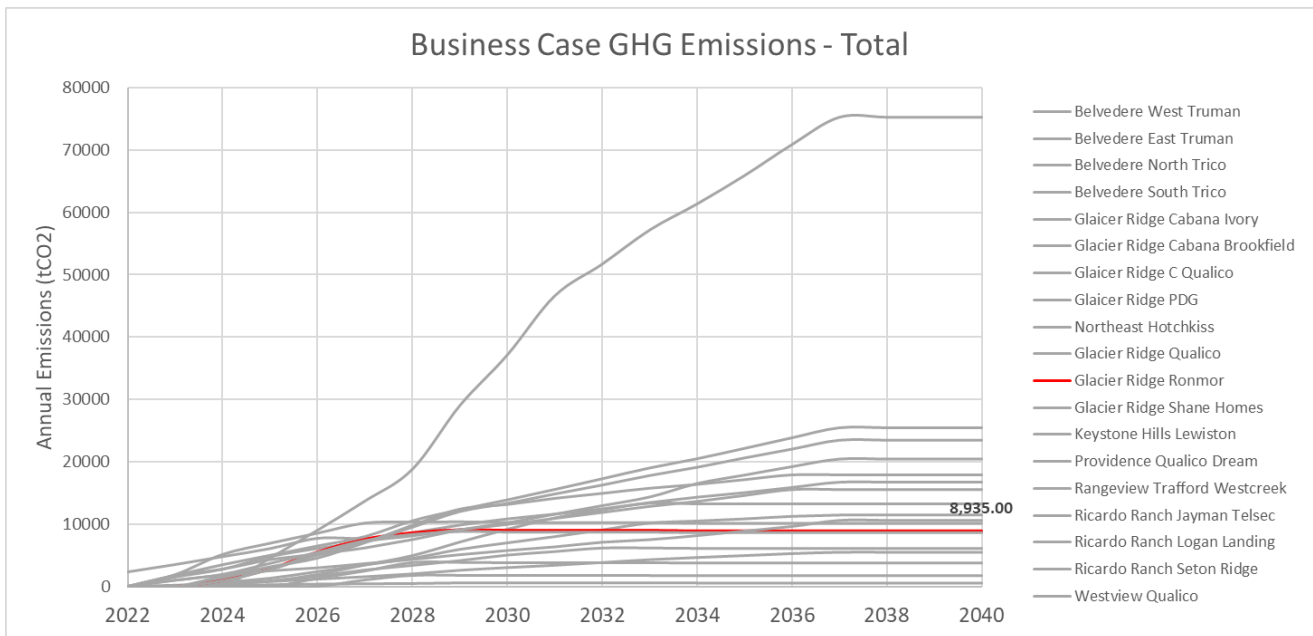
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.



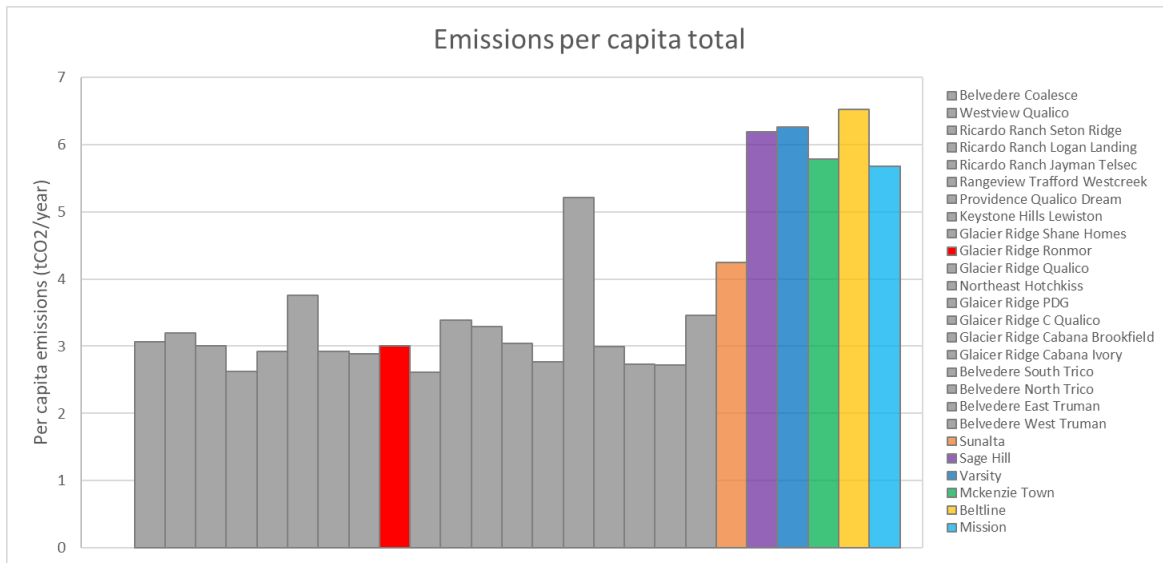
Downtown, LRT and airport travel are the largest contributors to amenity/work-based travel emissions at Glacier Ridge Ronmor. At full build out, Glacier Ridge Ronmor has an emission per capita from transportation of 1.36 tCO2 and annual emissions are forecasted to be 4,053.58 tCO2/year.

Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 8,935.00 tCO2/year and 3.00 tCO2/capita at full build out. Estimated population at full build out is ~2975 people.



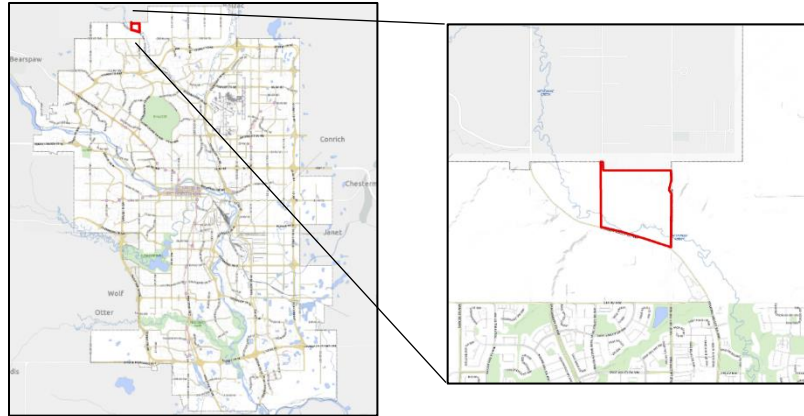
Mitigating measures - buildings



Emissions from Glacier Ridge Ronmor can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation)

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 16% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 10% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 31% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 60%** from baseline, taking building emissions from 4,881.43 tCO2/year to 1965.90 tCO2/year.



Glacier Ridge Shane Homes is a mixed-use development situated in the north west quadrant of the city that is planned to begin construction in the year 2024.

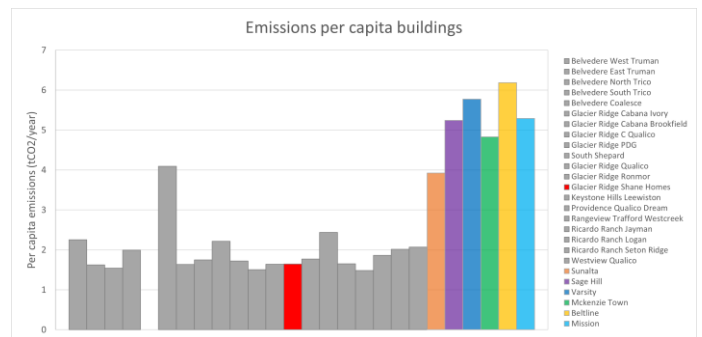
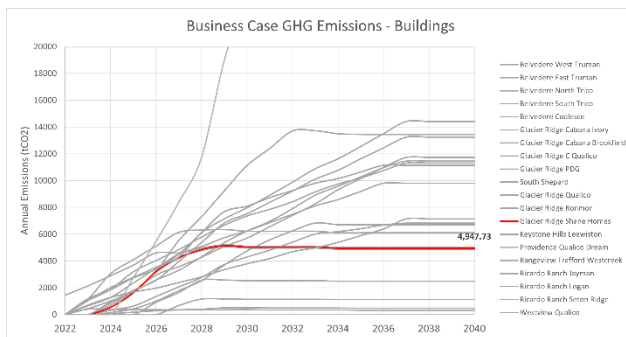
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	10	20	20	30	20	0	0	0	0	0	0	0	0	0	0	0	0
Single Family	0	0	90	181	271	0	90	45	0	0	0	0	0	0	0	0	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	0	0	226	0	0	0	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	5,167	5,597	0	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Diverse housing offering stated, therefore assumes 25% of builds are townhomes*

Greenhouse Gas emissions – Buildings

What we heard: Considering, electric vehicle charging retrofit, better performing fixtures and appliances that reduce energy and water consumption. At a minimum, residences will be solar ready.

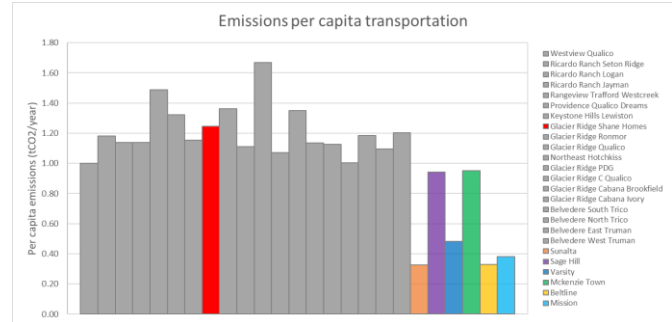
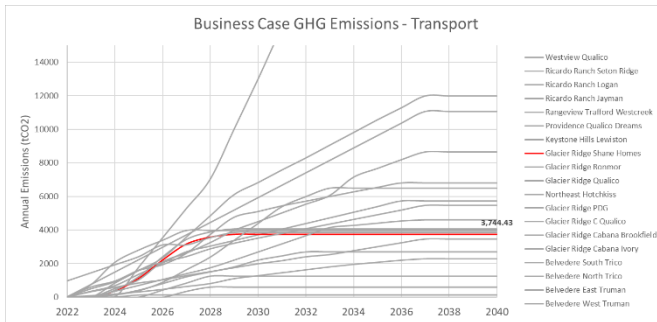


**Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040*

At full build out, annual emissions from the operations of buildings at Glacier Ridge Shane Homes are forecasted to be 4,947.73 tCO2/year, this equates to an emission per capita of 1.64tCO2 at full build out. Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.

Greenhouse Gas emissions – Transportation

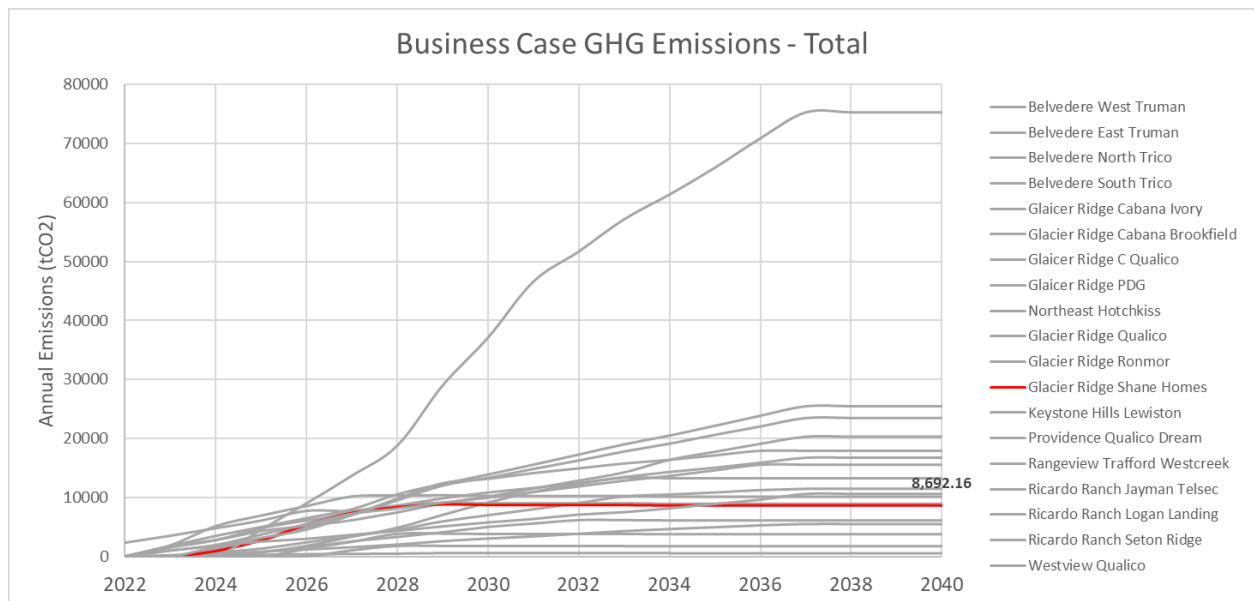
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities, and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

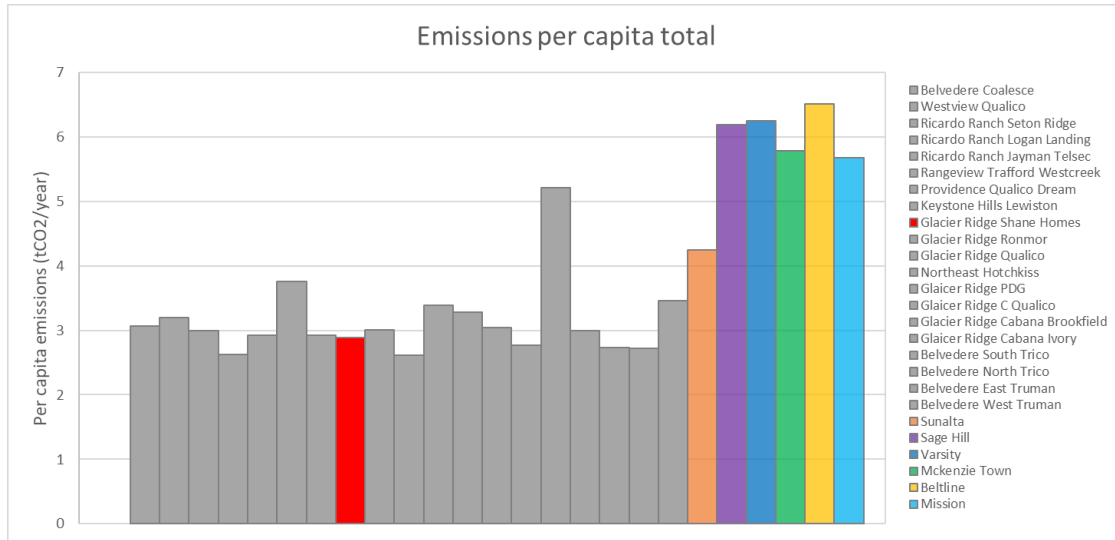


Downtown, health service and airport travel are the largest contributors to amenity/work-based travel emissions at Glacier Ridge Shane Homes. At full build out, Glacier Ridge Shane Homes has an emission per capita from transportation of 1.24tCO₂ and annual emissions are forecasted to be 3744.43 tCO₂/year.

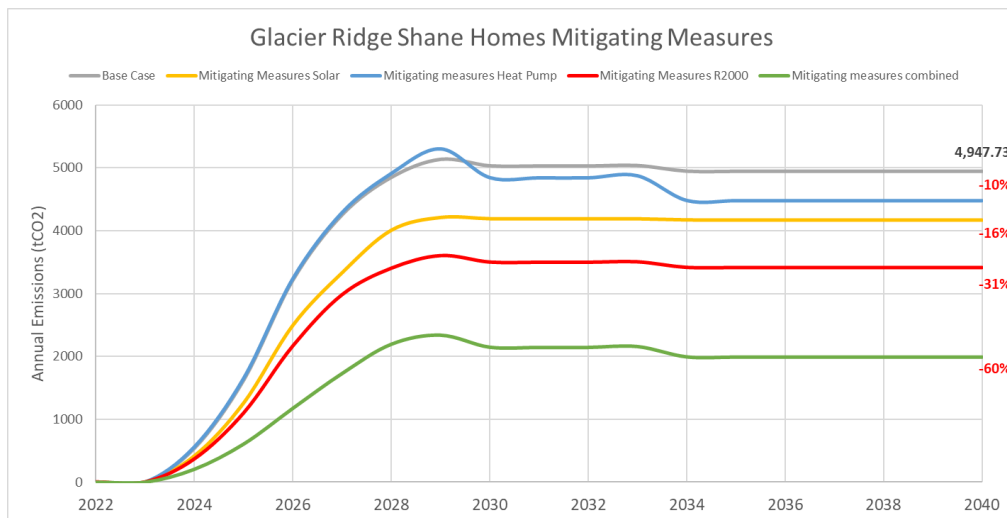
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 8,546.55 tCO₂/year and 2.84tCO₂/capita at full build out. Estimated population at full build out is ~3010 people.





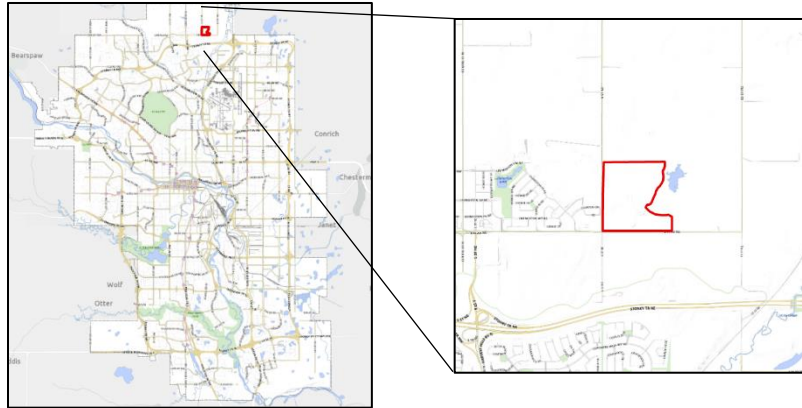
Mitigating measures



Emissions from Glacier Ridge Shane Homes can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (Mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation)

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 16% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 10% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 31% reduction in emissions

Combined these measures could lead to an emissions reduction potential of **60%** from baseline, taking building emissions from 4,947.73 tCO2/year to 1992.90 tCO2/year.



Keystone Hills Lewiston is a mixed-use development situated in the northeast quadrant of the city that is planned to begin construction in the year 2023.

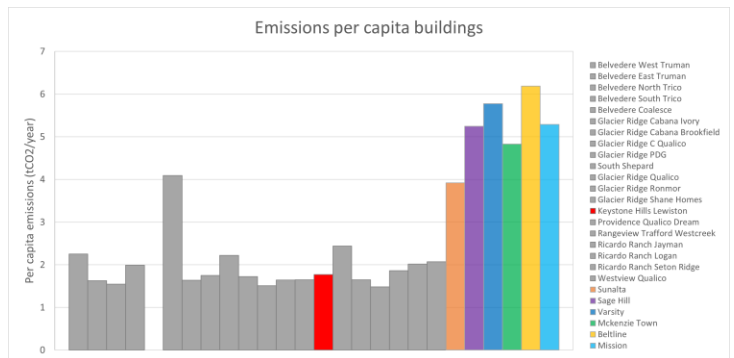
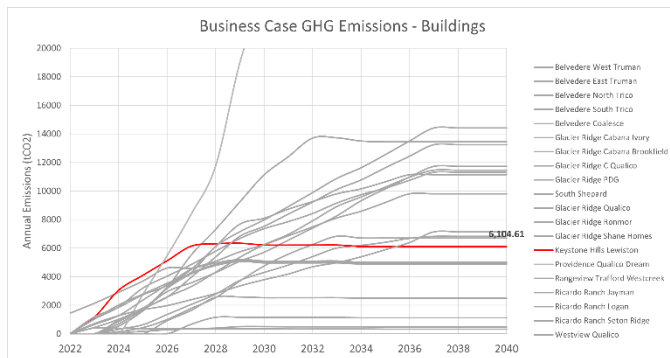
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	50	50	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Single Family	0	175	180	134	180	181	0	0	0	0	0	0	0	0	0	0	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	180	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	0	32,000	0	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Diverse housing offering stated, therefore assumes 25% of builds are townhomes*

Greenhouse Gas emissions – Buildings

What we heard: Rough in for solar panel installation and EV charging stations, installation of high efficiency furnaces and hot water tanks, LED lighting and provision of options for Smart Home technology.

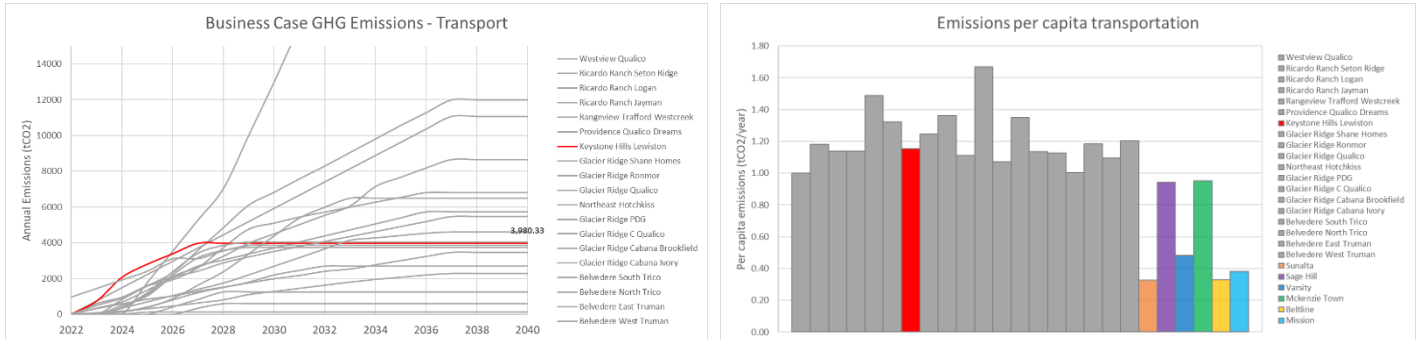


**Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040*

At full build out, annual emissions from the operations of buildings at Keystone Hills Lewiston are forecasted to be 6,104.61 tCO2/year, this equates to an emission per capita of 1.77tCO2 at full build out. Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.

Greenhouse Gas emissions – Transportation

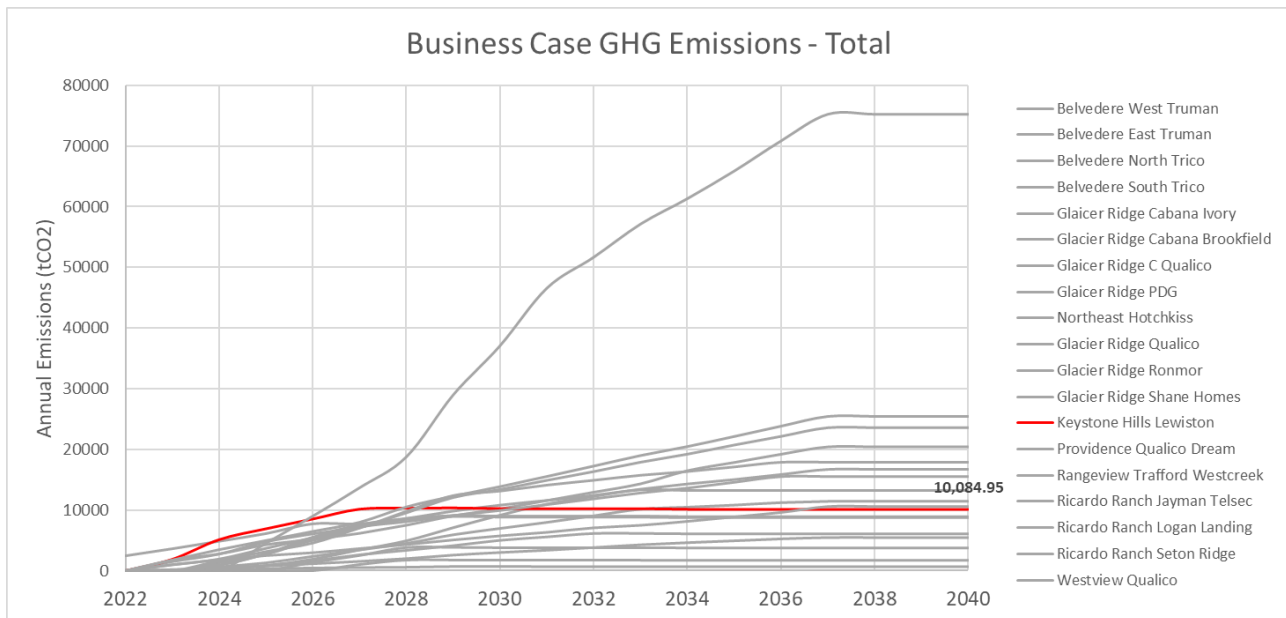
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

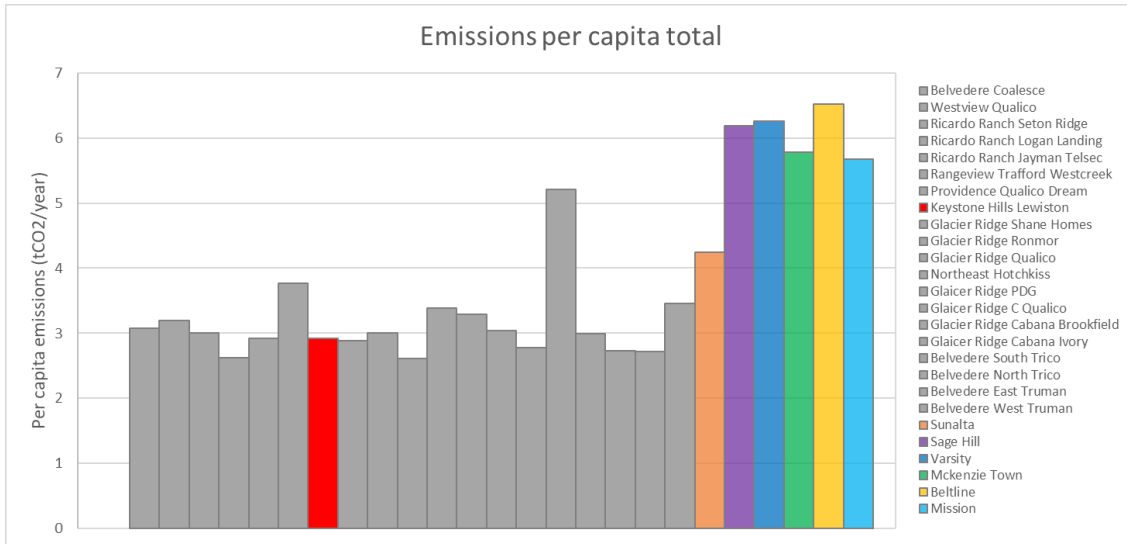


Downtown, health service and airport travel are the largest contributors to amenity/work-based travel emissions at Keystone Hills Lewiston. At full build out, Keystone Hills Lewiston has an emission per capita from transportation of 1.15 tCO2 and annual emissions are forecasted to be 3980.33 tCO2/year

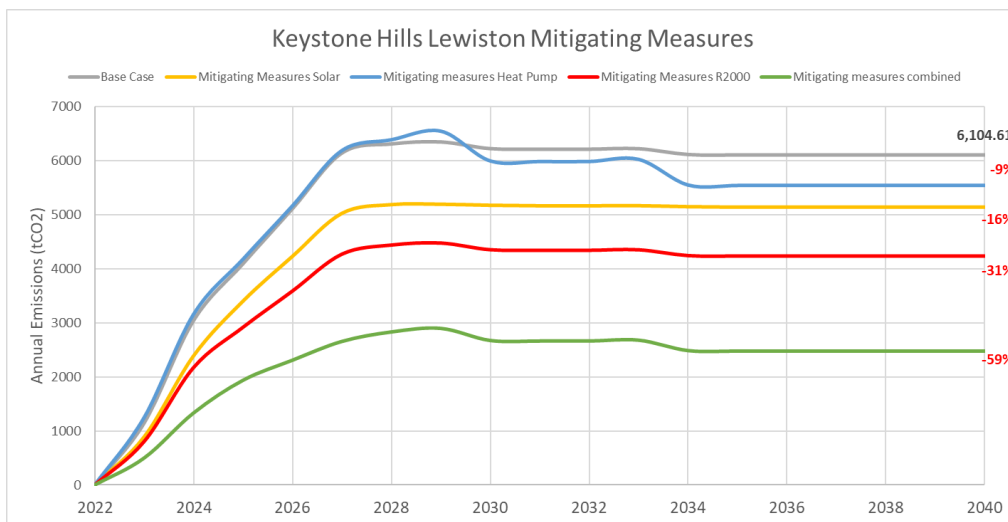
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 10,084.90 tCO2/year and 2.92 tCO2/capita at full build out. Estimated population at full build out is ~8050 people.





Mitigating measures

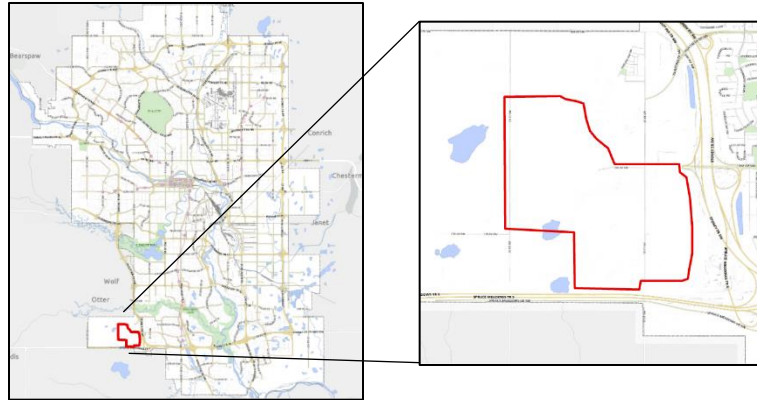


Emissions from Keystone Hills Lewiston can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation)

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 16% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 9% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 31% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 59%** from baseline, taking building emissions from 6,104.61 tCO₂/year to 2480.39 tCO₂/year.

Providence Qualico Dream Hopewell Ronmor – Greenhouse Gas Emissions Analysis



Providence Qualico Dream Hopewell Ronmor is a mixed-use development situated in the south-west quadrant of the city that is planned to begin construction in the year 2025.

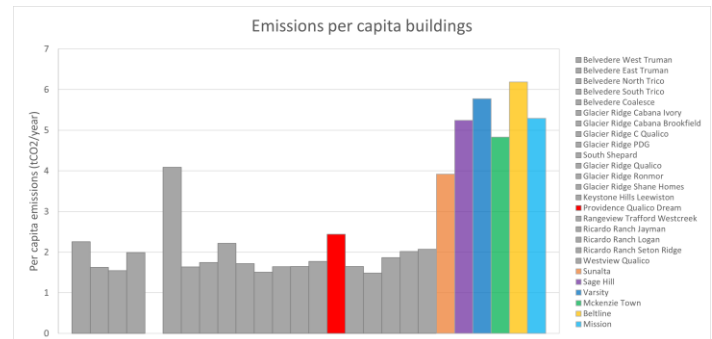
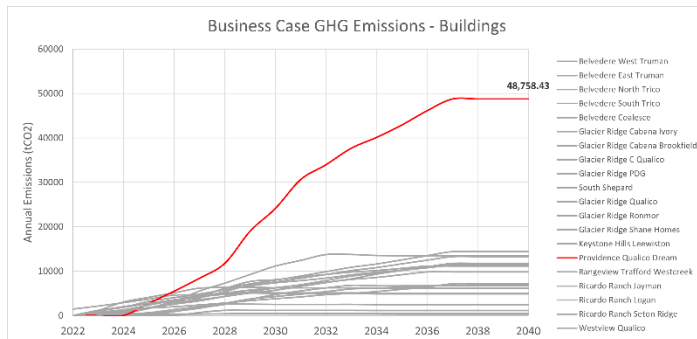
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	0	180	173	173	173	173	173	173	173	173	173	173	173	173	0	0	0
Single Family	0	0	0	405	405	405	405	405	405	405	304	405	405	405	405	405	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	0	0	0	0	405	405	405	101	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	0	0	0	64,000	310,400	64,000	144,000	0	0	64,000	0	0	0	0
Retail (sq.ft)	0	0	0	0	0	32,000	96,000	425,600	112,000	144,000	83,200	48,000	48,000	96,000	48,000	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*Diverse housing offering stated, therefore assumes 25% of builds are townhomes

Greenhouse Gas emissions – Buildings

What we heard: Look to encourage active modes of transportation.

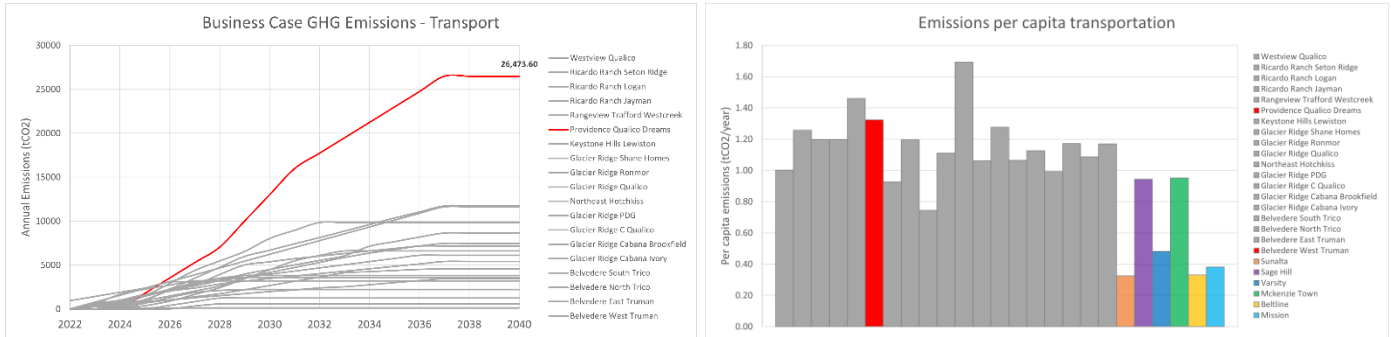


*Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040

At full build out, annual emissions from the operations of buildings at Providence Qualico Dream Hopewell Ronmor are forecasted to be 48,758.43 tCO2/year, this equates to an emission per capita of 2.44 tCO2 at full build out. *Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.*

Greenhouse Gas emissions – Transportation

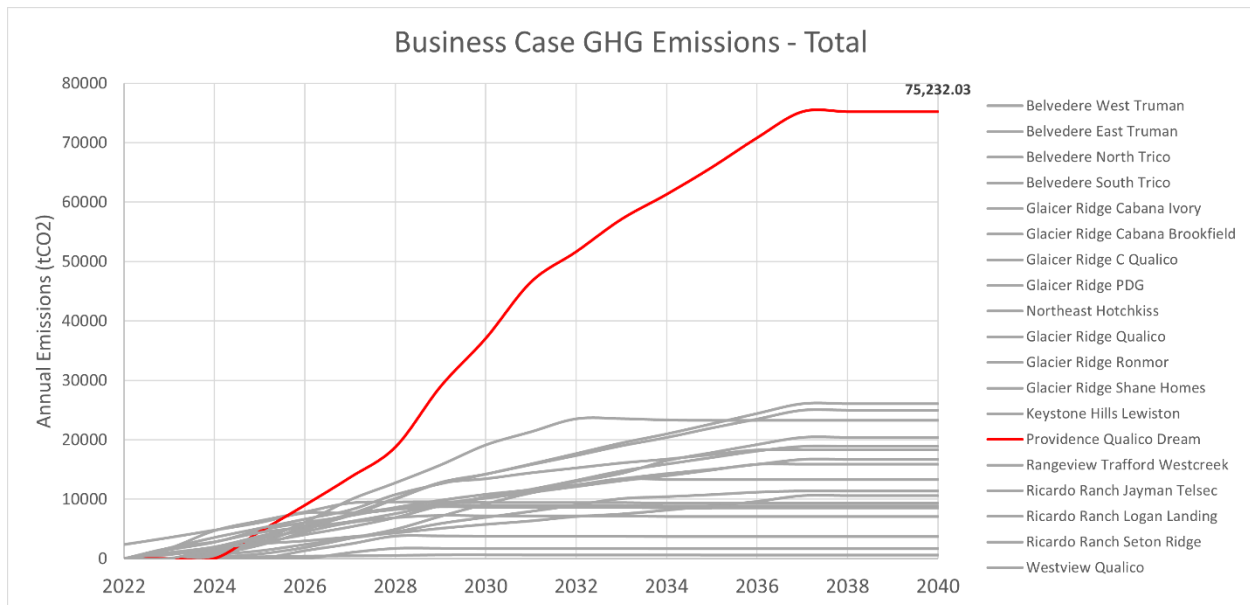
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

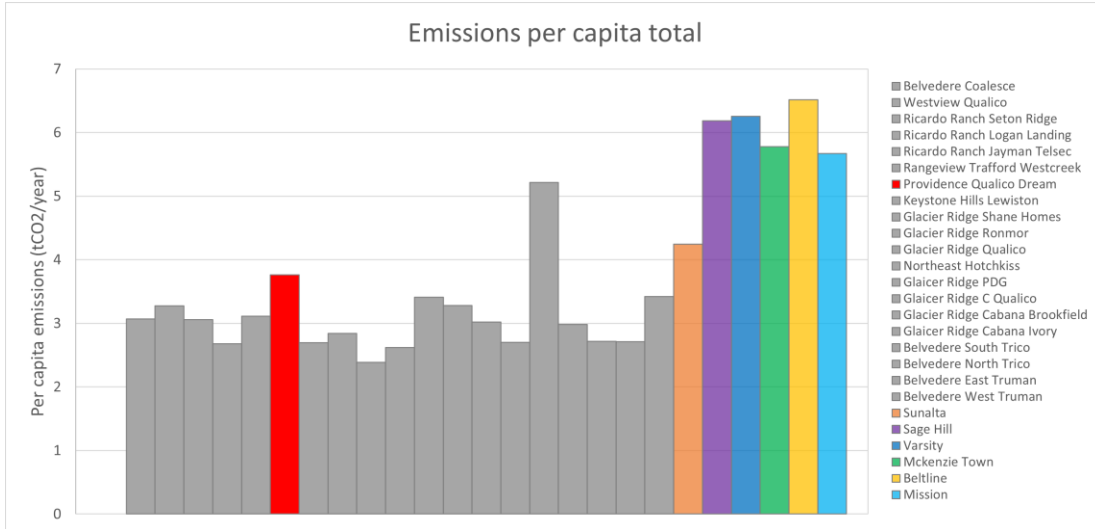


Downtown, health service and airport travel are the largest contributors to amenity/work-based travel emissions at Providence Qualico Dream Hopewell. At full build out, Providence Qualico Dream Hopewell Ronmor has an emission per capita from transportation of 1.32 tCO2 and annual emissions are forecasted to be 26,473.60 tCO2/year.

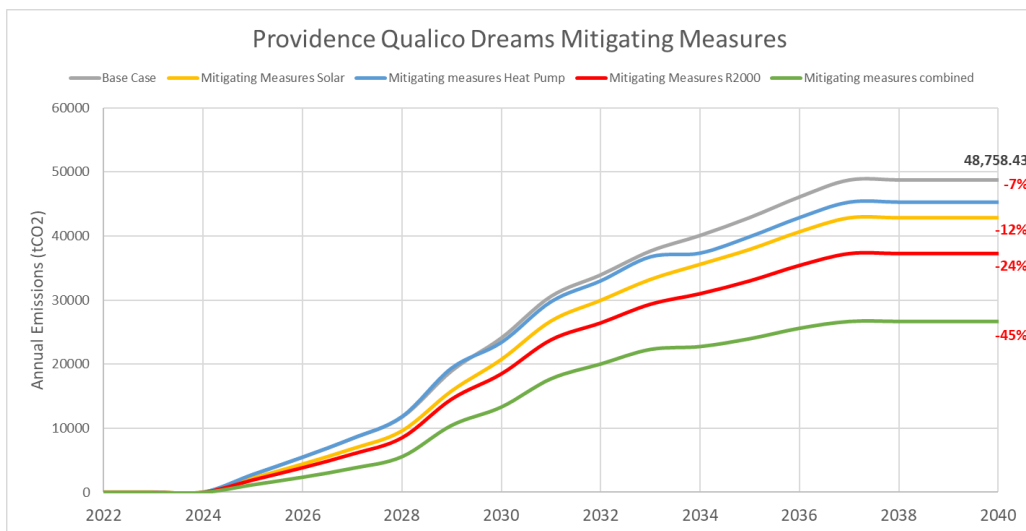
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 7,094.09 tCO2/year and 2.38 tCO2/capita at full build out. Estimated population at full build out is ~20,000 people.





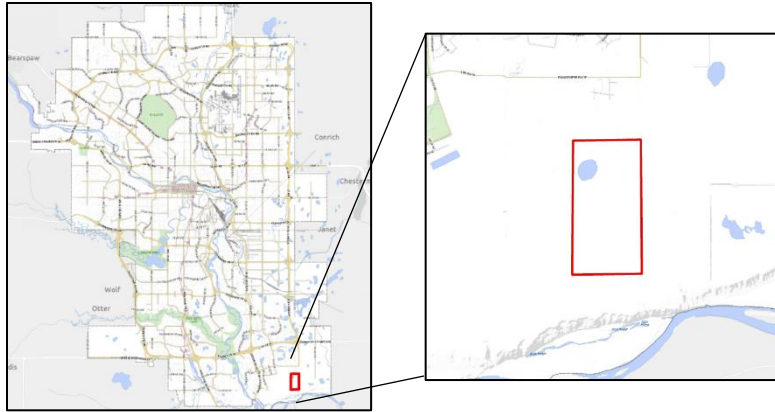
Mitigating measures - Buildings



Emissions from Providence Qualico Dream Hopewell Ronmor can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (Mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation).

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 12% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 7% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 24% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 45%** from baseline, taking building emissions from 48,758.43 tCO₂/year to 26,636.12 tCO₂/year.



Rangeview Trafford Westcreek is a mixed residential development situated in the south-east quadrant of the city that is planned to begin construction in the year 2024.

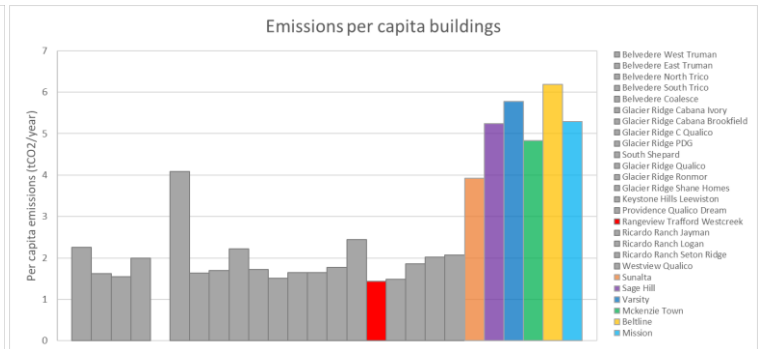
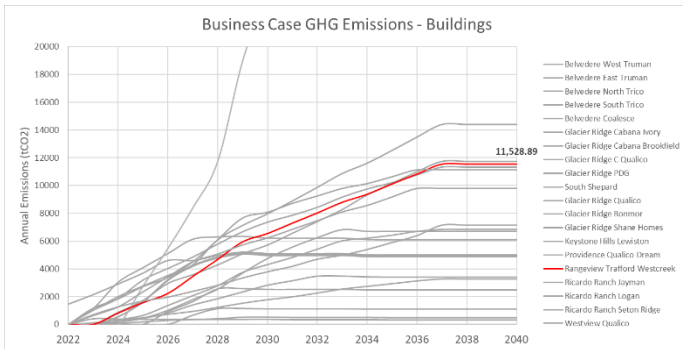
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	70	52	52	44	52	52	44	52	44	52	52	52	44	44	0	0	0
Single Family	0	0	113	111	55	113	111	111	111	111	111	113	111	113	110	110	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	0	55	113	111	111	0	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Diverse housing offering stated, therefore assumes 25% of builds are townhomes*

Greenhouse Gas emissions – Buildings

What we heard: A net zero ready vision utilizing passive solar gain, solar pv, EV charging.

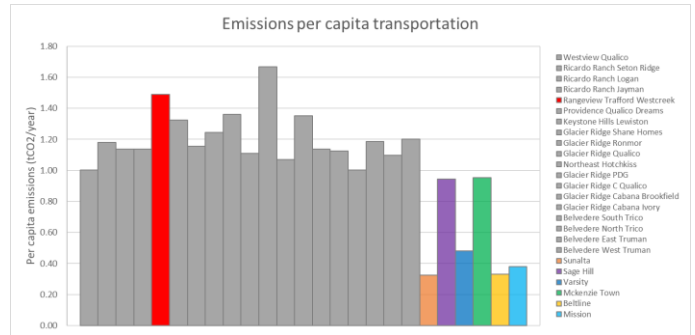
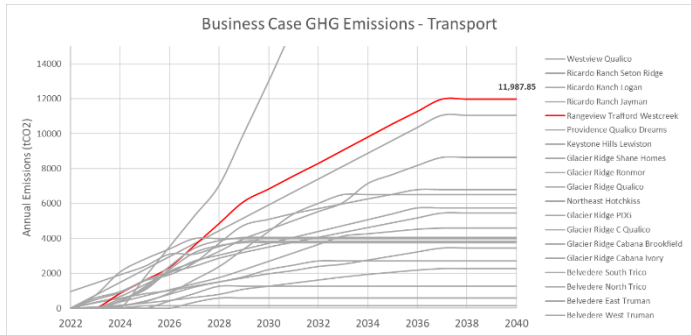


**Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040*

At full build out, annual emissions from the operations of buildings at Rangeview Trafford Westcreek are forecasted to be 11,528.90 tCO₂/year, this equates to an emission per capita of 1.43 tCO₂ at full build out. *Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.*

Greenhouse Gas emissions – Transportation

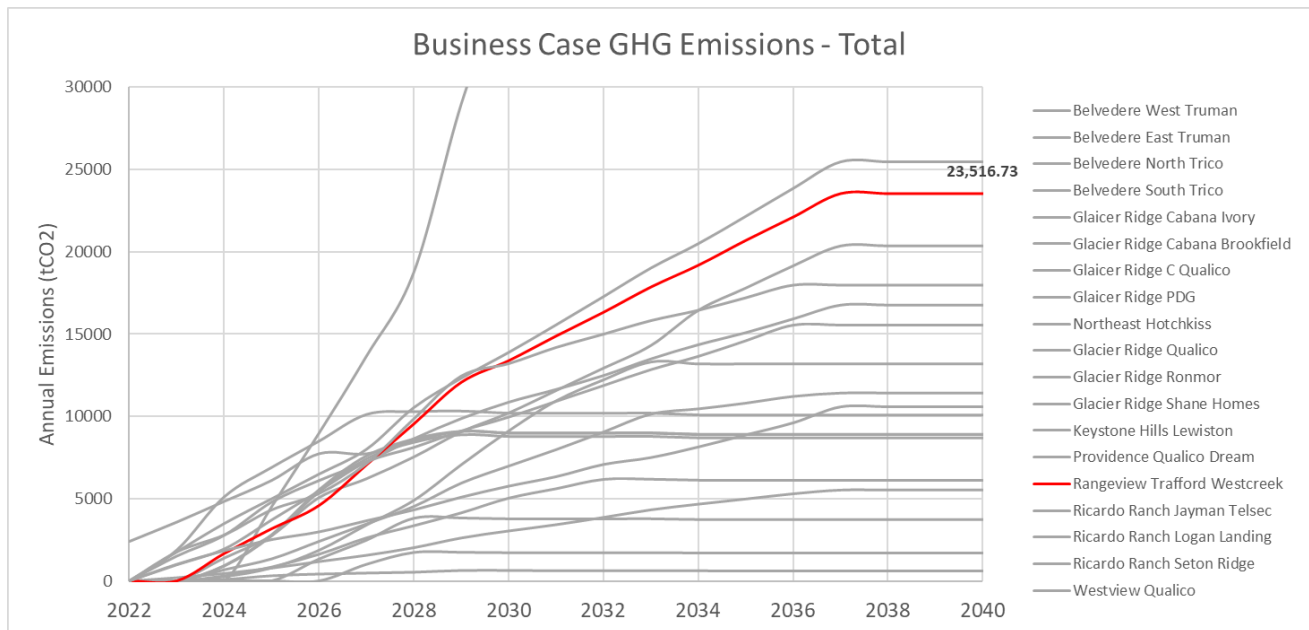
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

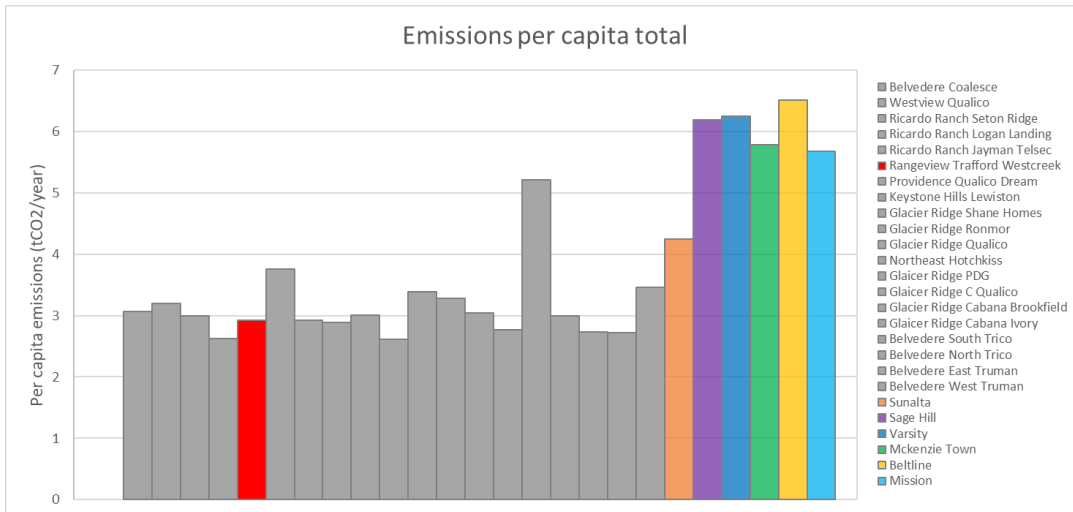


Downtown, health service and airport travel are the largest contributors to amenity/work-based travel emissions at Rangeview Trafford Westcreek. At full build out, Rangeview Trafford Westcreek has an emission per capita from transportation of 1.49 tCO2 and annual emissions are forecasted to be 11,988 tCO2/year.

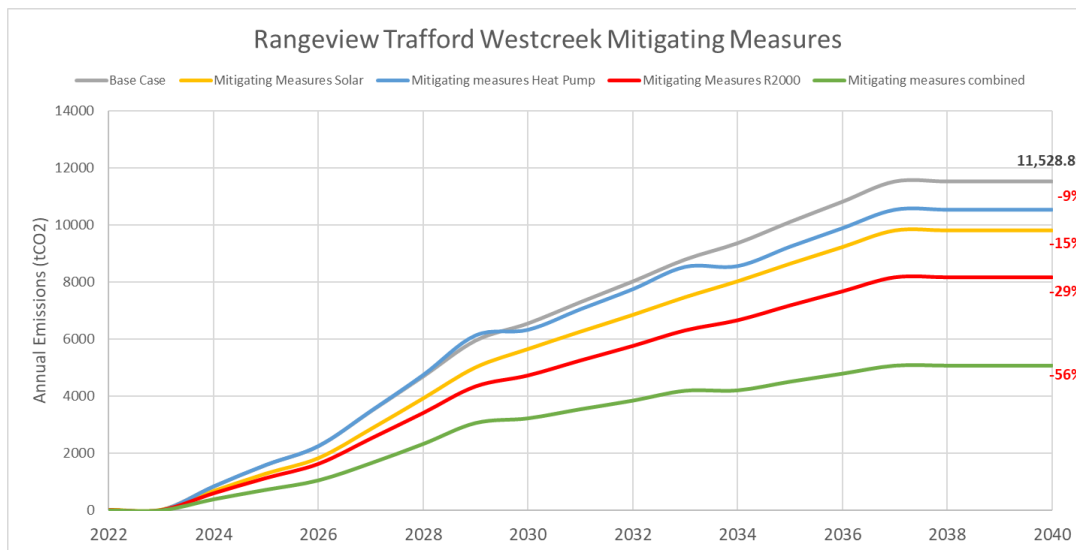
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 23,516.73 tCO2/year and 2.92 tCO2/capita at full build out. Estimated population at full build out is ~8050 people.





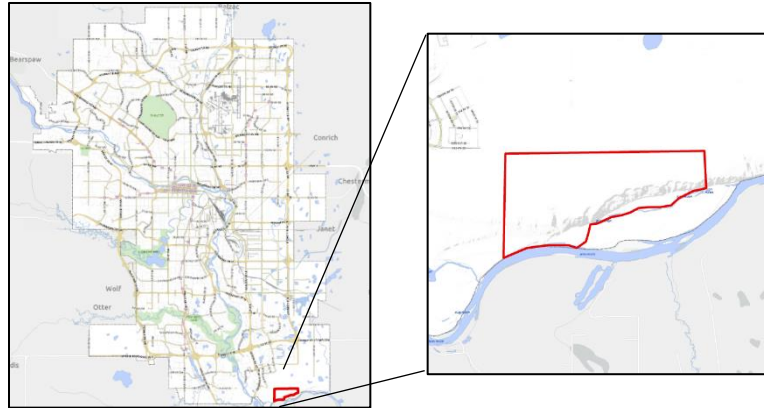
Mitigating measures - Buildings



Emissions from Rangeview Trafford Westcreek can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (Mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation).

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 15% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 9% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 29% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 56%** from baseline, taking building emissions from 11,528.90 tCO₂/year to 5,069.73 tCO₂/year.



Ricardo Ranch Jayman Telsec is a mixed residential development situated in the south-east quadrant of the city that is planned to begin construction in the year 2023.

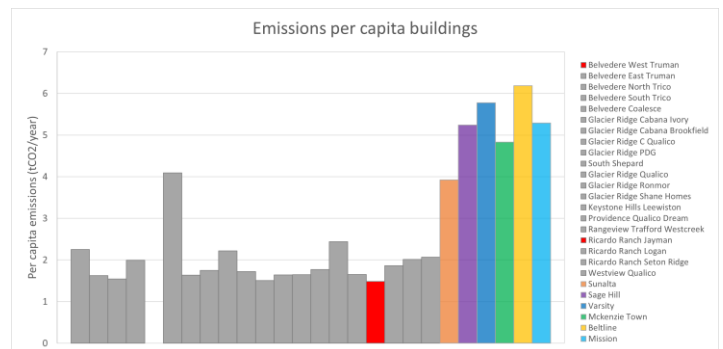
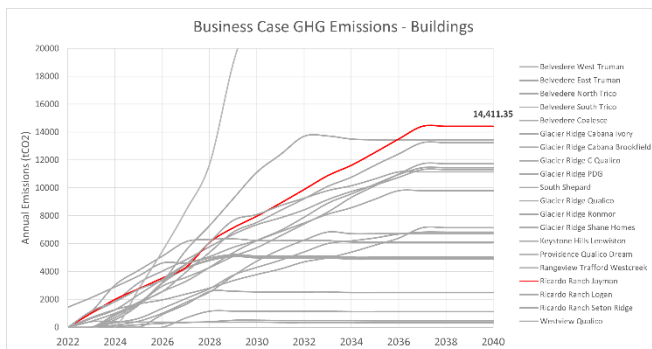
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	75	75	75	75	75	75	75	75	75	75	75	75	75	75	71	0	0	0
Single Family	0	175	175	0	0	0	46	175	175	175	175	175	175	175	175	166	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	175	175	175	129	0	0	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	0	0	0	0	150,000	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*Diverse housing offering stated, therefore assumes 25% of builds are townhomes

Greenhouse Gas emissions – Buildings

What we heard: Net Zero Ready, geo-exchange and heat-pump ready, 20% better than code (included in modelling), EV chargers.

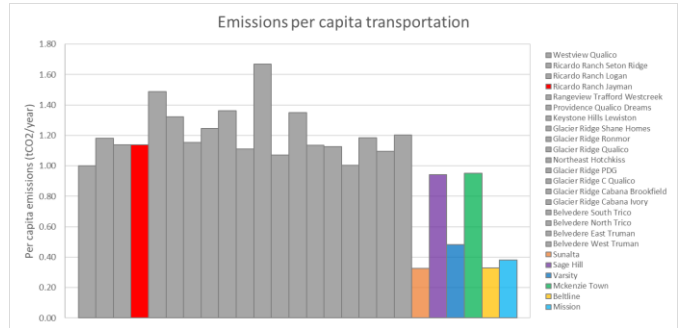
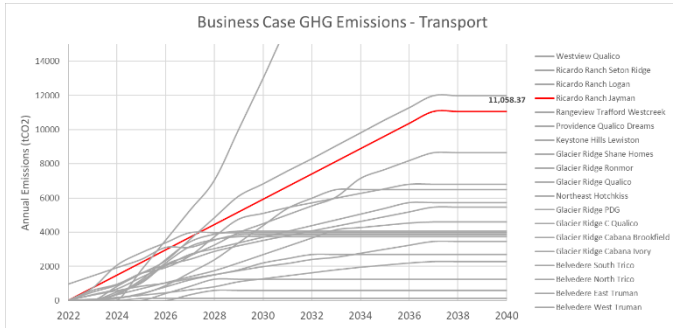


*Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040

At full build out, annual emissions from the operations of buildings at Ricardo Ranch Jayman Telsec are forecasted to be 14,411.35 tCO2/year, this equates to an emission per capita of 1.48 tCO2 at full build out. Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.

Greenhouse Gas emissions – Transportation

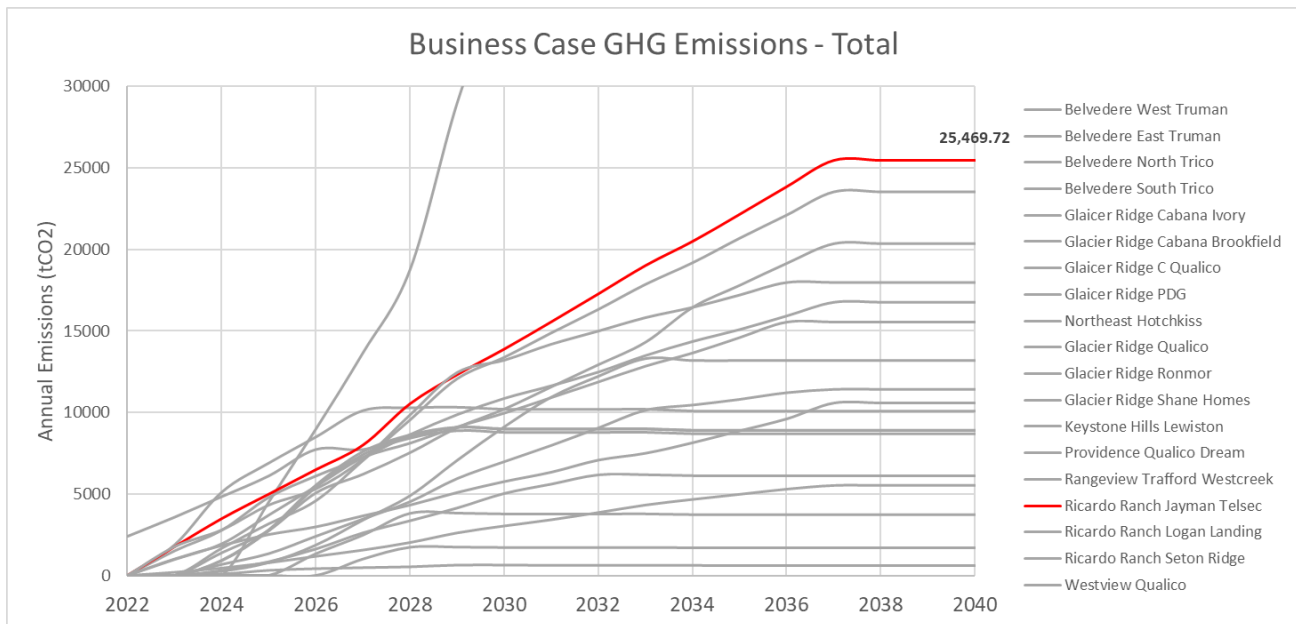
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

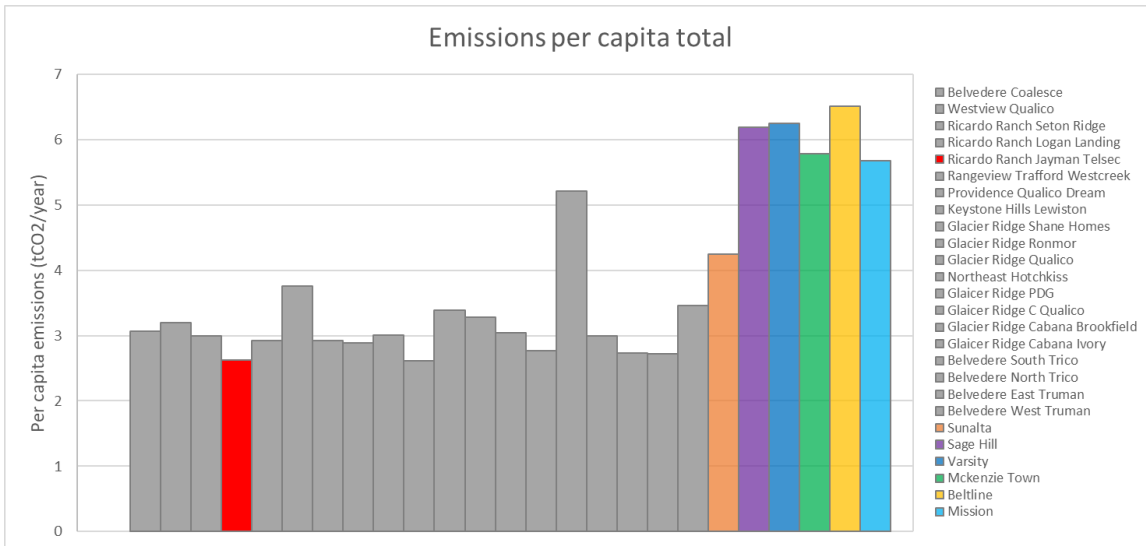


Airport, post-secondary schools, and downtown travel are the largest contributors to amenity/work-based travel emissions at Ricardo Ranch Jayman Telsec. At full build out, Ricardo Ranch Jayman Telsec has an emission per capita from transportation of 1.14 tCO₂ and annual emissions are forecasted to be 11,058.37 tCO₂/year.

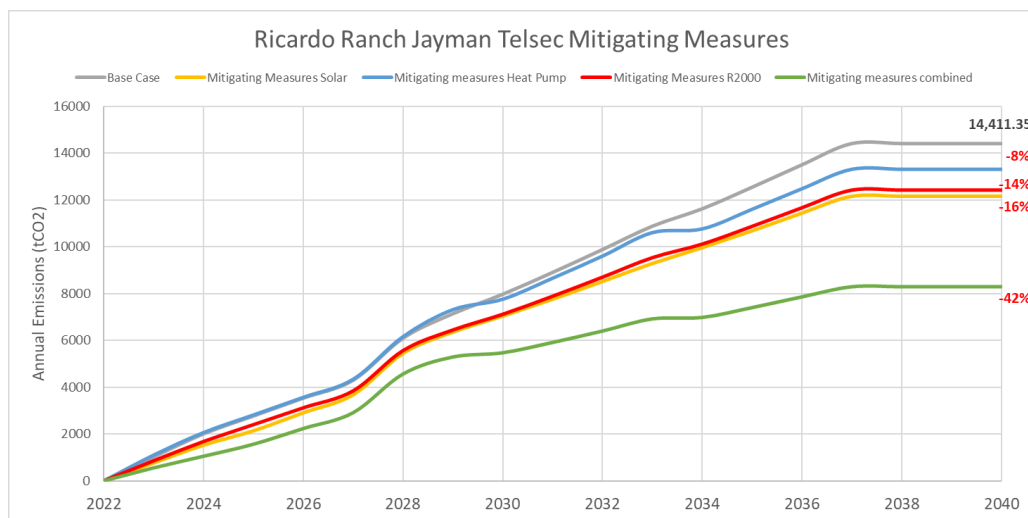
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 25,469.72 tCO₂/year and 2.62 tCO₂/capita at full build out. Estimated population at full build out is ~9715 people.





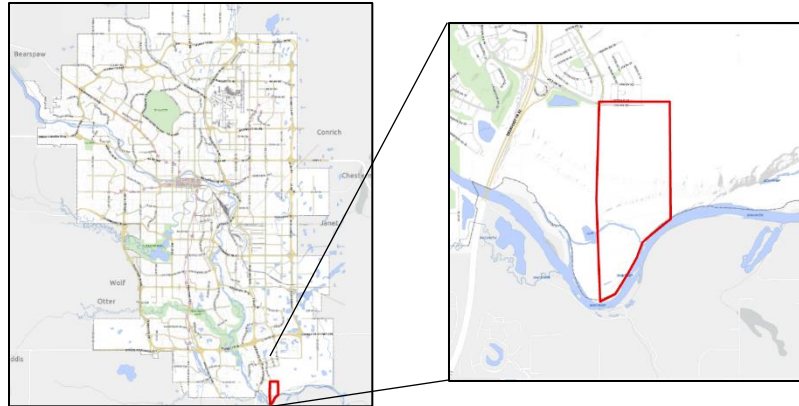
Mitigating measures – Buildings



Emissions from Ricardo Ranch Jayman Telsec can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation).

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 16% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 8% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 14% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 42%** from baseline, taking building emissions from 14,411.35 tCO₂/year to 8,306.83 tCO₂/year.



Ricardo Ranch Logan Landing is a mixed-use development situated in the southeast quadrant of the city that is planned to begin construction in the year 2023.

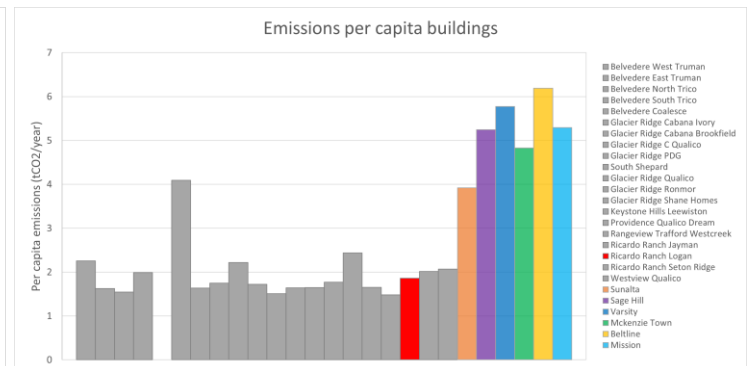
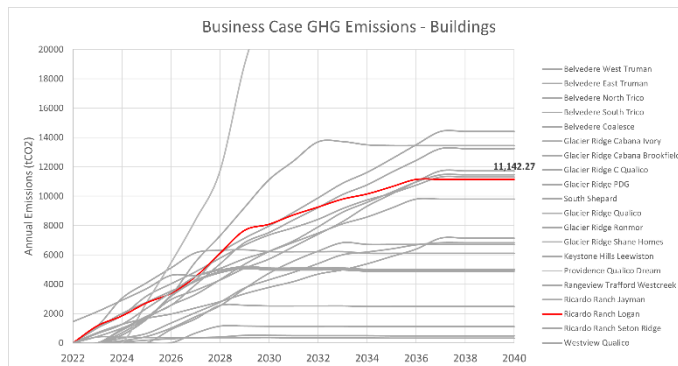
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	0	100	0	0	150	119	0	0	0	0	0	0	0	0	0	0	0
Single Family	0	200	120	115	115	115	115	115	63	115	94	94	94	90	90	0	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	0	0	115	115	115	52	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	0	0	0	0	15,000	15,000	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Diverse housing offering stated, therefore assumes 25% of builds are townhomes*

Greenhouse Gas emissions – Buildings

What we heard: Rough in for solar panel installation and for EV charging stations, installation of high efficiency furnaces and hot water tanks, including LED lighting and options for Smart Home technology

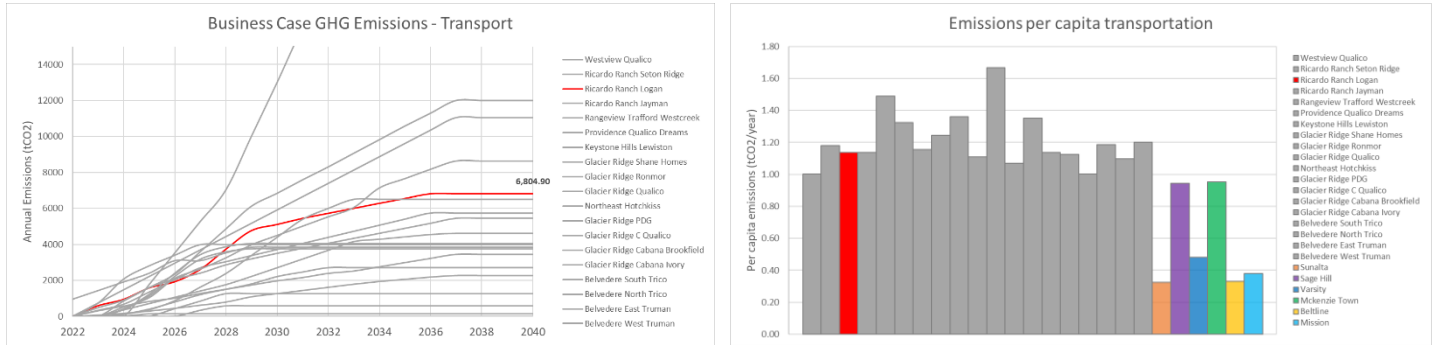


**Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040*

At full build out, annual emissions from the operations of buildings at Ricardo Ranch Logan landing are forecasted to be 11,142.27 tCO2/year, this equates to an emission per capita of 1.86 tCO2 at full build out. *Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.*

Greenhouse Gas emissions – Transportation

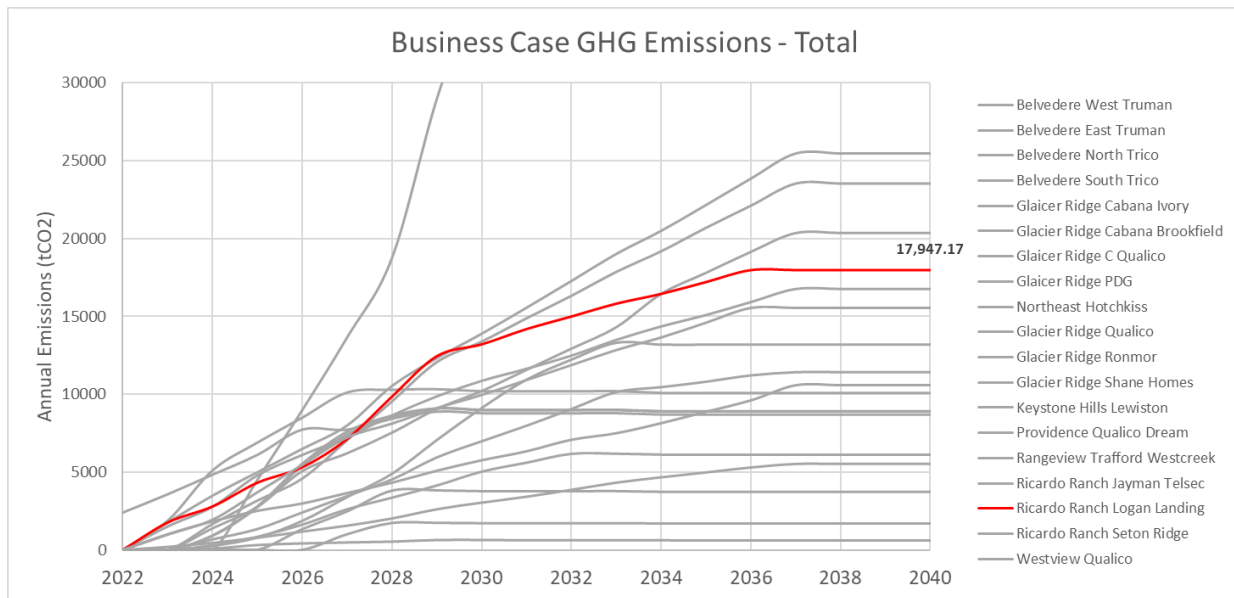
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

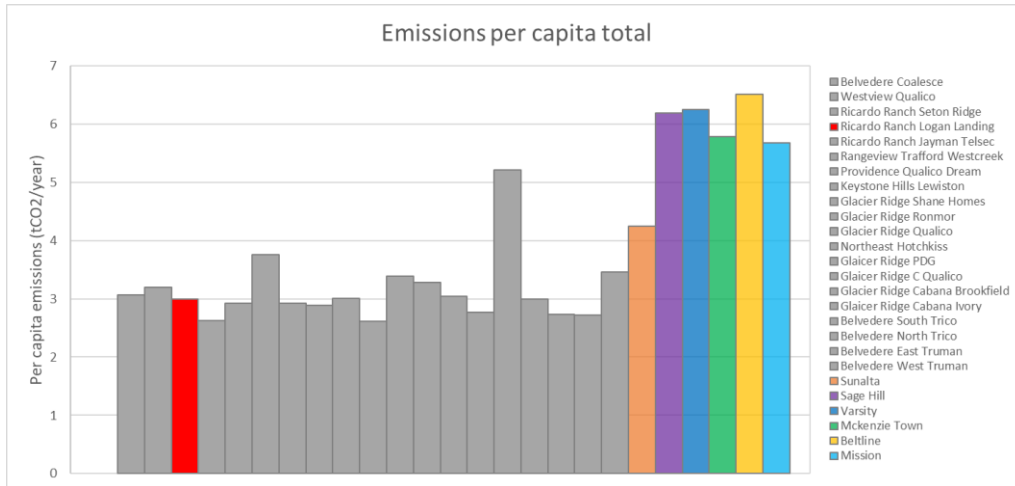


Airport, downtown and post-secondary school travel are the largest contributors to amenity/work-based travel emissions at Ricardo Ranch Logan Landing. At full build out, Ricardo Ranch Logan Landing has an emission per capita from transportation of 1.14 tCO₂ and annual emissions are forecasted to be 6,804.90 tCO₂/year.

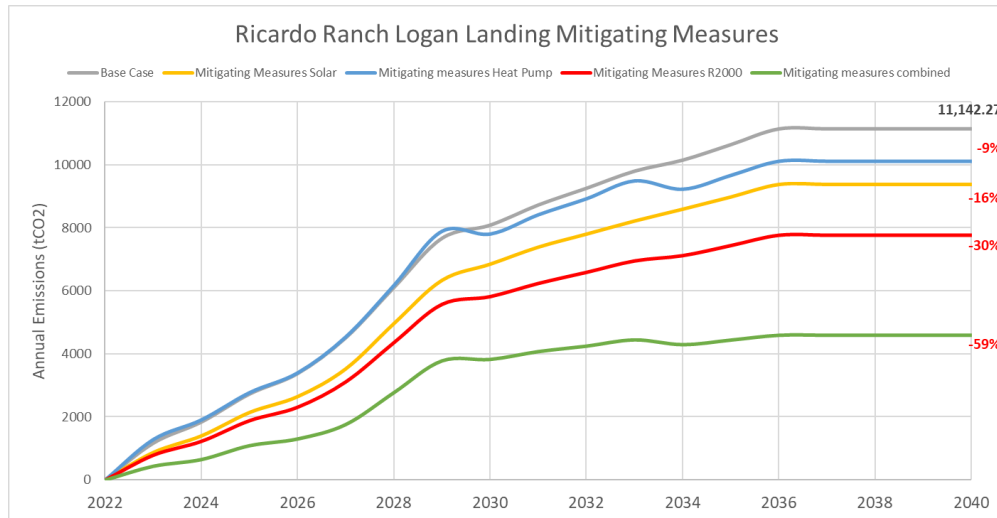
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 18,300.18 tCO₂/year and 3.06 tCO₂/capita at full build out. Estimated population at full build out is ~5980 people.





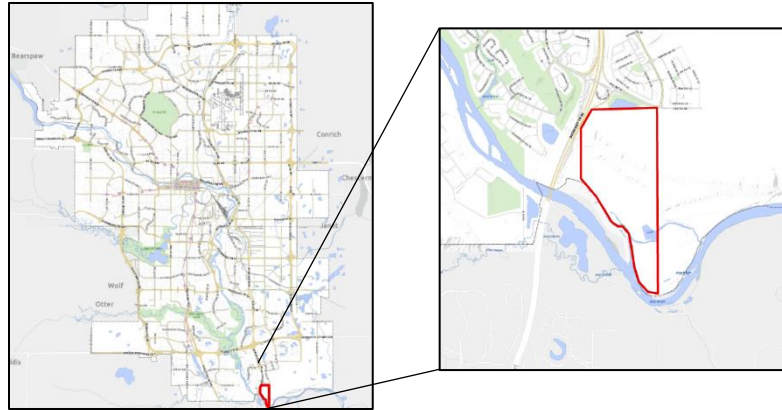
Mitigating measures - Buildings



Emissions from Ricardo Ranch Logan Landing can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation).

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 16% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 9% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 30% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 59%** from baseline, taking building emissions from 11,142.27 tCO2/year to 4,595.69 tCO2/year.



Ricardo Seton Ridge is a mixed residential development situated in the south-east quadrant of the city that is planned to begin construction in the year 2023.

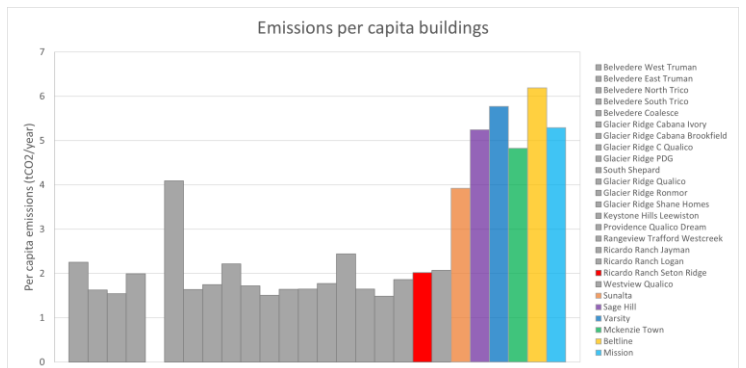
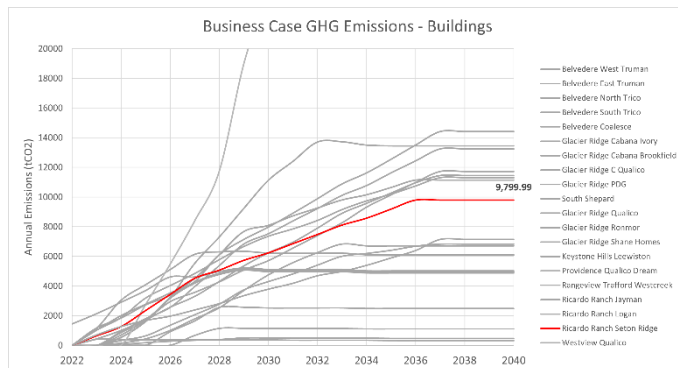
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Single Family	0	110	110	110	110	110	110	55	110	110	110	110	110	110	110	0	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	110	110	110	55	0	0	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*Diverse housing offering stated, therefore assumes 25% of builds are townhomes

Greenhouse Gas emissions – Buildings

What we heard: Supporting low carbon travel by designing complete neighborhoods

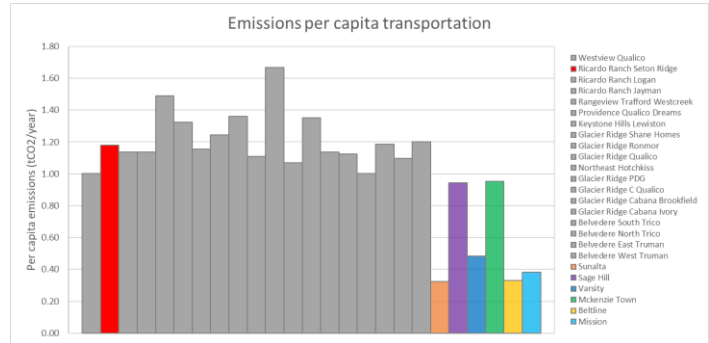
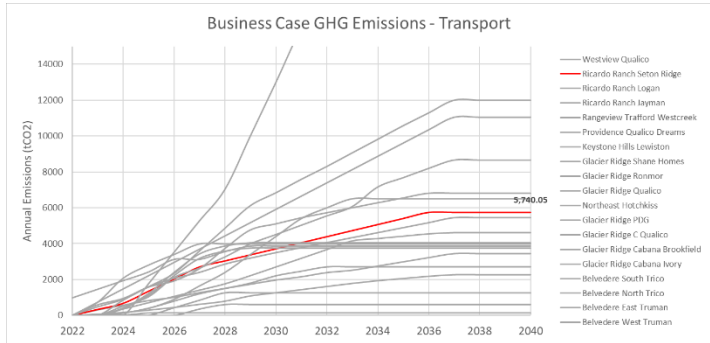


*Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040

At full build out, annual emissions from the operations of buildings at Ricardo Ranch Seton Ridge are forecasted to be 9,799.99 tCO2/year, this equates to an emission per capita of 2.02 tCO2 at full build out. *Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.*

Greenhouse Gas emissions – Transportation

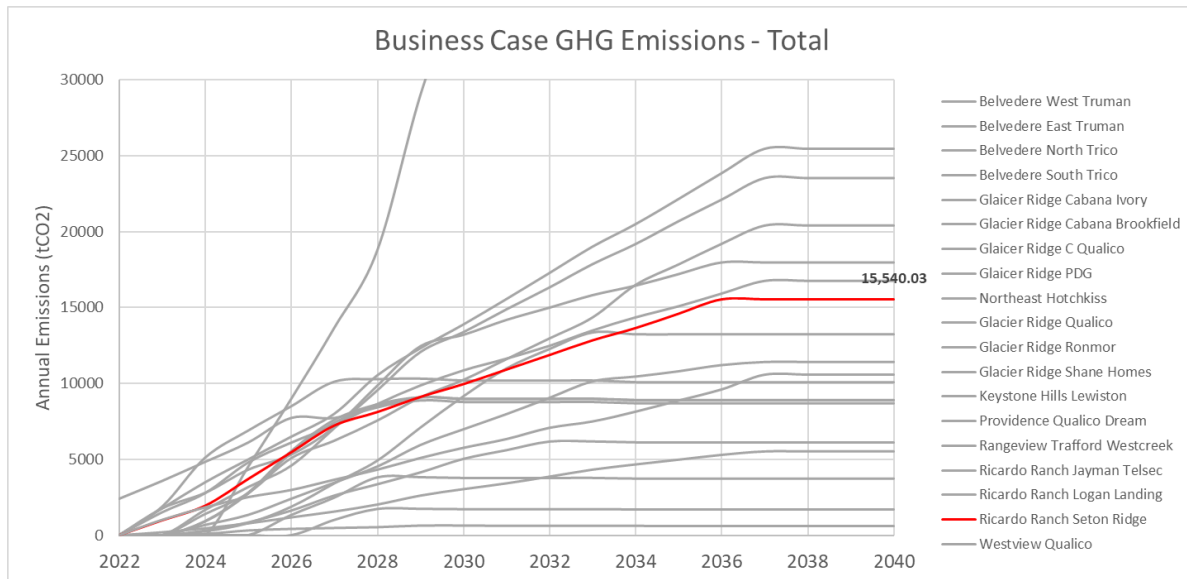
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

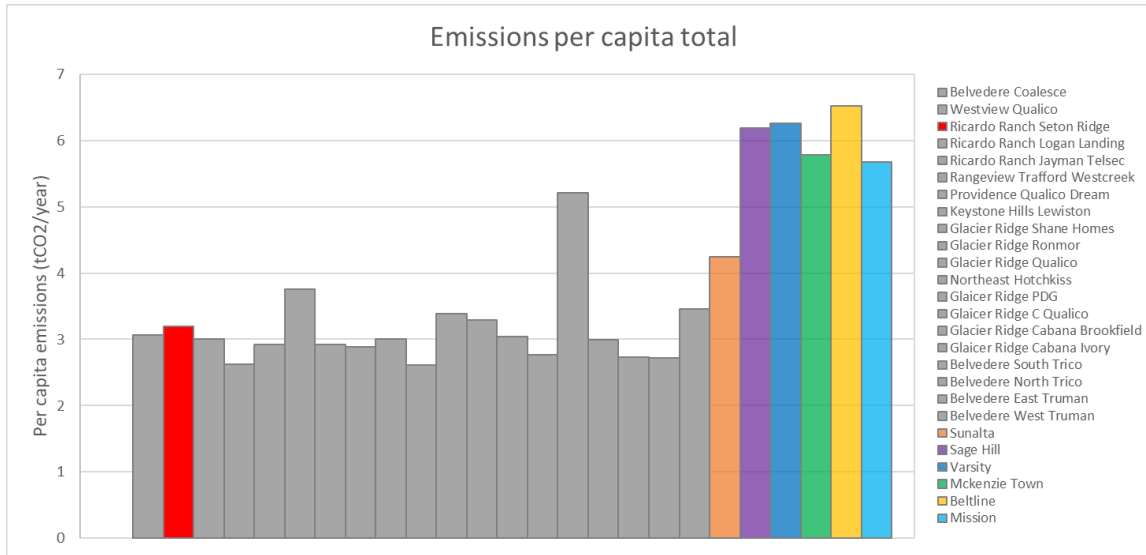


Airport, post-secondary school, and downtown travel are the largest contributors to amenity/work-based travel emissions at Ricardo Ranch Seton Ridge. At full build out, Ricardo Ranch Seton Ridge has an emission per capita from transportation of 1.18 tCO2 and annual emissions are forecasted to be 5,740 tCO2/year.

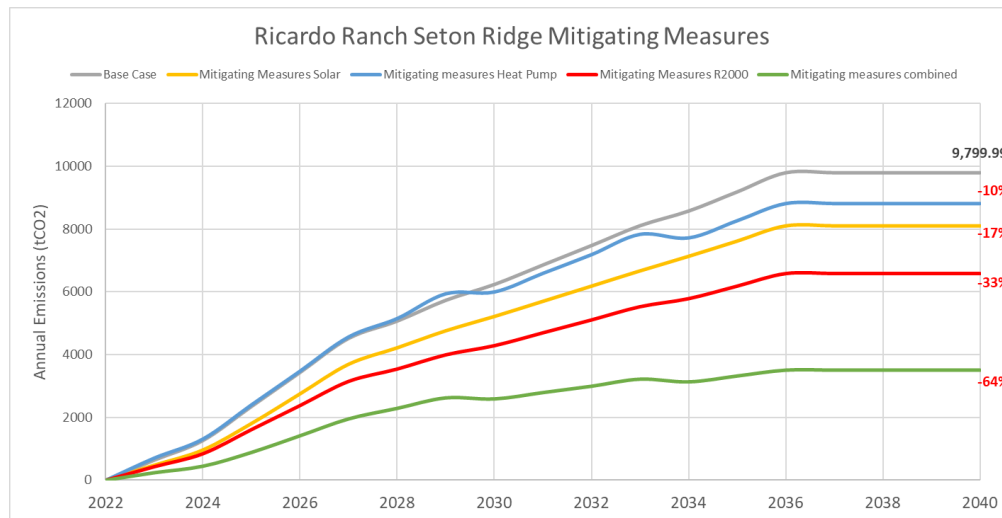
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 15,540.03 tCO2/year and 3.20 tCO2/capita at full build out. Estimated population at full build out is ~4860 people.





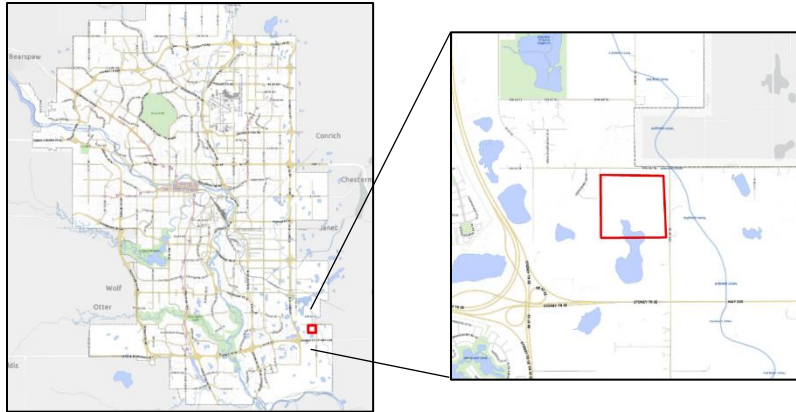
Mitigating measures - Buildings



Emissions from Ricardo Ranch Seton Ridge can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation).

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 17% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 10% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 33% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 64%** from baseline, taking building emissions from 9,799.99 tCO₂/year to 3,510.13 tCO₂/year.



Northeast Hotchkiss is a mixed residential development situated in the southeast quadrant of the city that is planned to begin construction in the year 2024.

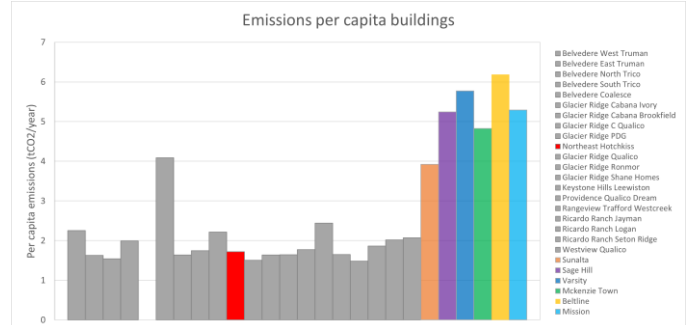
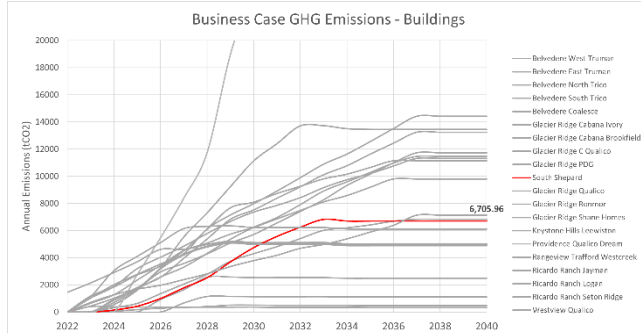
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Single Family	0	0	25	50	100	101	75	200	200	0	120	101	0	0	0	0	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	0	0	49	75	0	0	200	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Diverse housing offering stated, therefore assumes 25% of builds are townhomes*

Greenhouse Gas emissions – Buildings

What we heard: Considering, high efficiency furnaces, low-flow faucets and toilets, solar panels, heaters and HWT, electric vehicle charging, and pursuing green home builders.

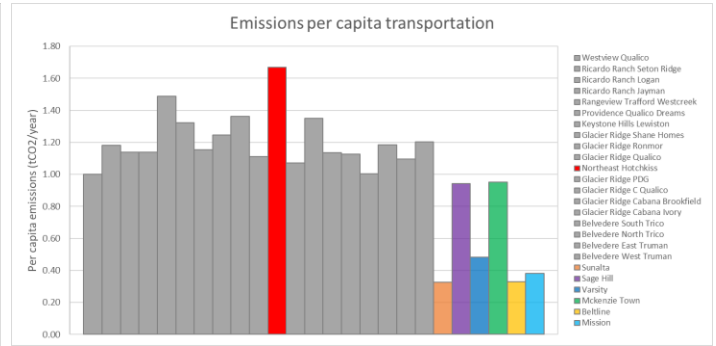
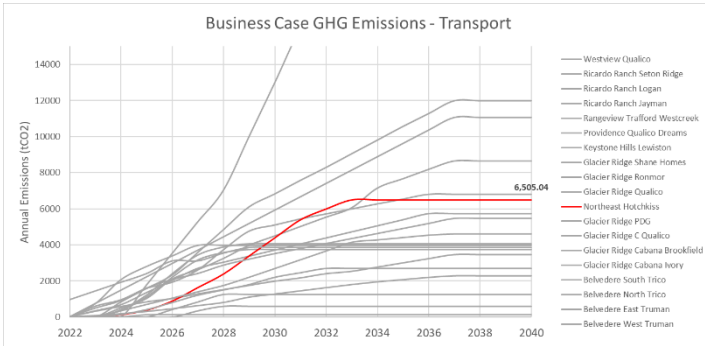


**Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040*

At full build out, annual emissions from the operations of buildings at Northeast Hotchkiss are forecasted to be 6,705.96 tCO₂/year, this equates to an emission per capita of 1.72tCO₂ at full build out. Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.

Greenhouse Gas emissions – Transportation

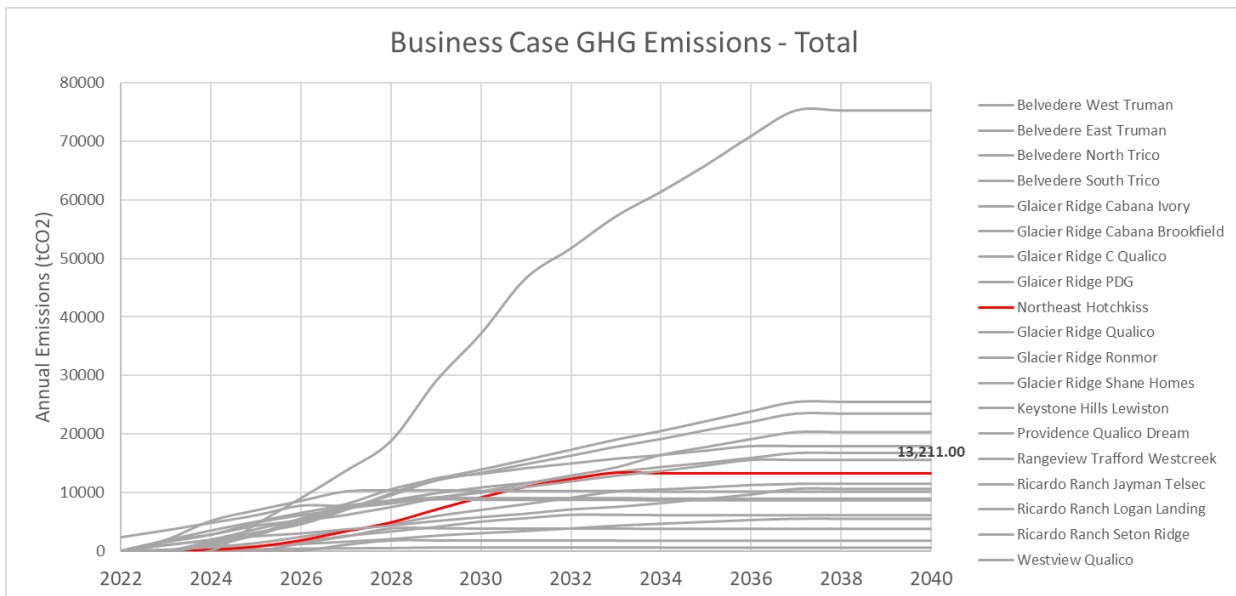
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

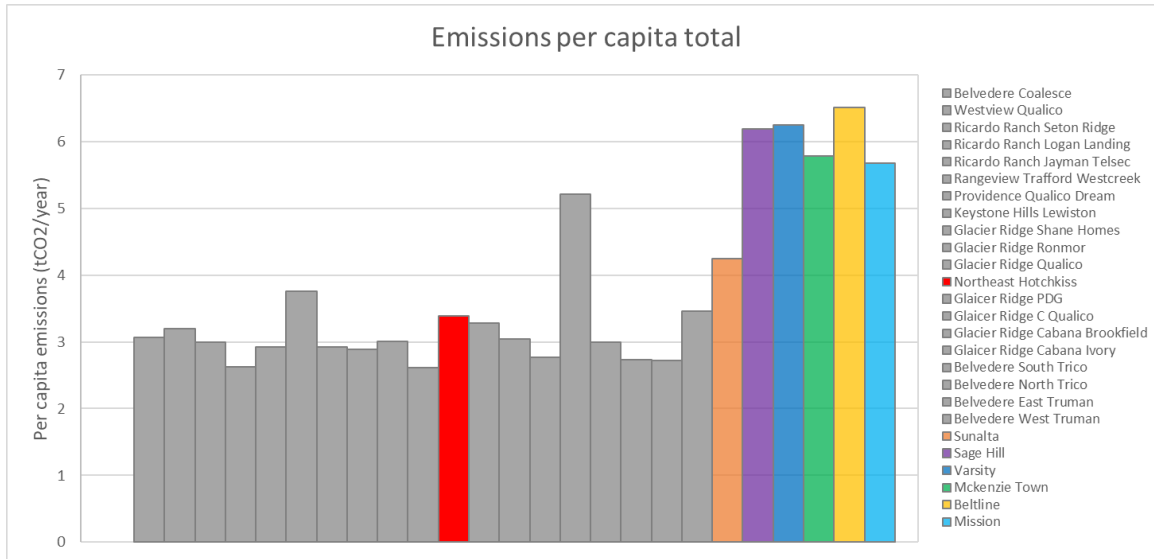


Airport and downtown travel are the largest contributors to amenity/work-based travel emissions at Northeast Hotchkiss. At full build out, Northeast Hotchkiss has an emission per capita from transportation of 1.67 tCO₂ and annual emissions are forecasted to be 6505.04 tCO₂/year.

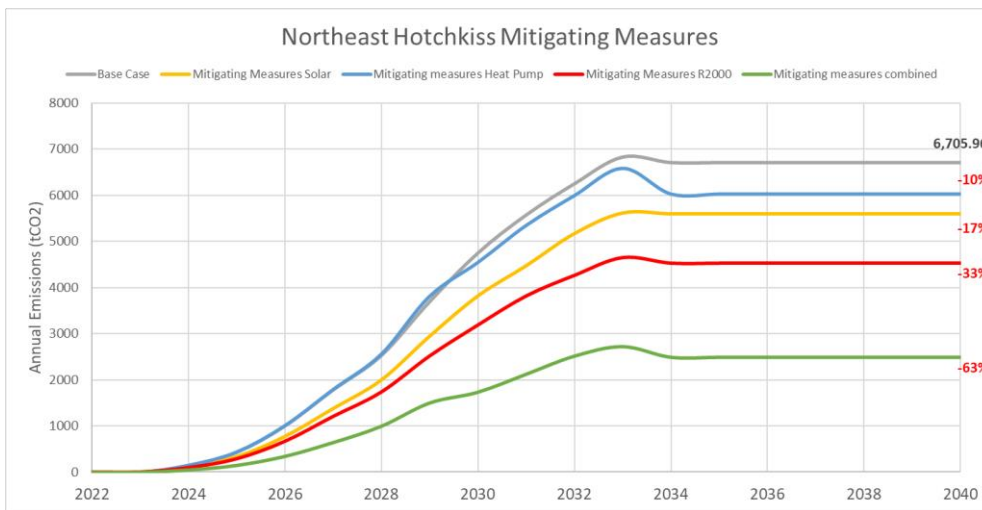
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 13,211.00 tCO₂/year and 3.39 tCO₂/capita at full build out. Estimated population at full build out is ~3900 people.





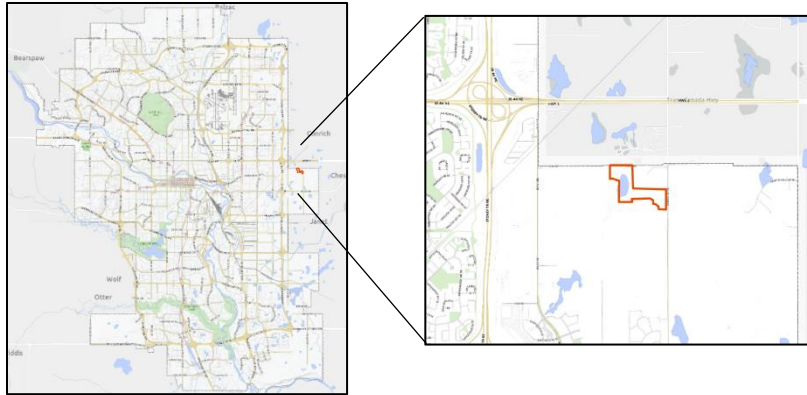
Mitigating measures - Buildings



Emissions from Northeast Hotchkiss can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation)

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 17% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 10% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 33% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 63%** from baseline, taking building emissions from 6,705.96 tCO₂/year to 2482.37 tCO₂/year.



Belvedere West Truman is a single-family home development situated in the east of the city that is planned to begin construction in the year 2027.

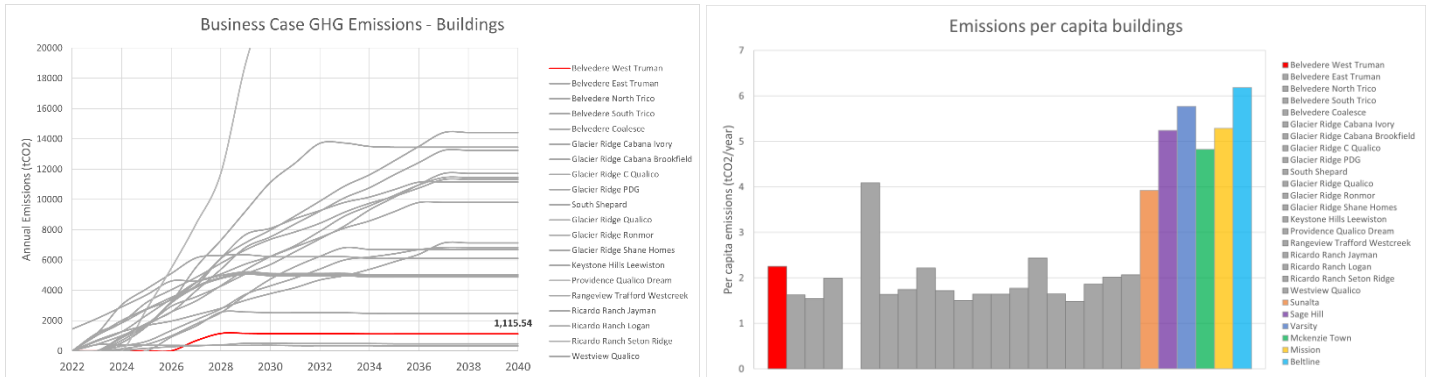
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Single Family	0	0	0	0	0	117	84	0	0	0	0	0	0	0	0	0	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*Assumes 25% of single-family builds are townhomes

Greenhouse Gas emissions – Buildings

What we heard: The proponent will, use energy efficiency strategies aligned with the National Energy Code for Buildings.

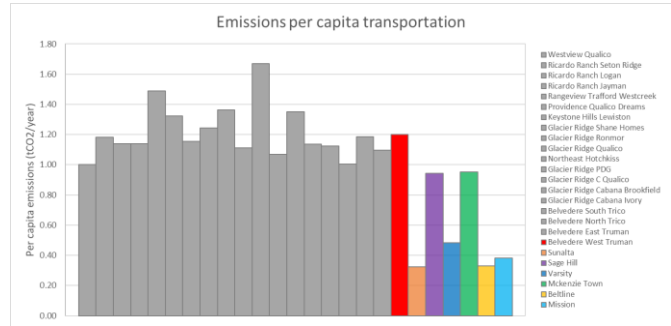
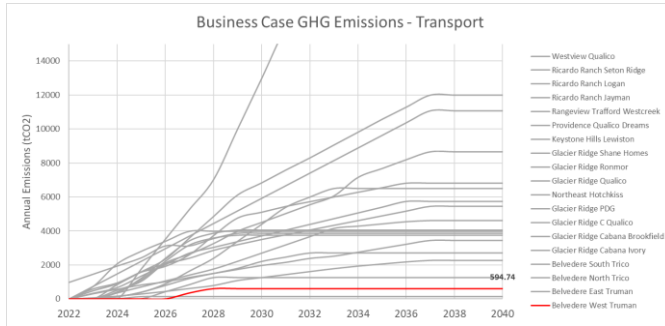


*Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040

At full build out, annual emissions from the operations of buildings at Belvedere West Truman are forecasted to be 1,115.54 tCO2/year, this equates to an emission per capita of 2.25 tCO2 at full build out. Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.

Greenhouse Gas emissions – Transportation

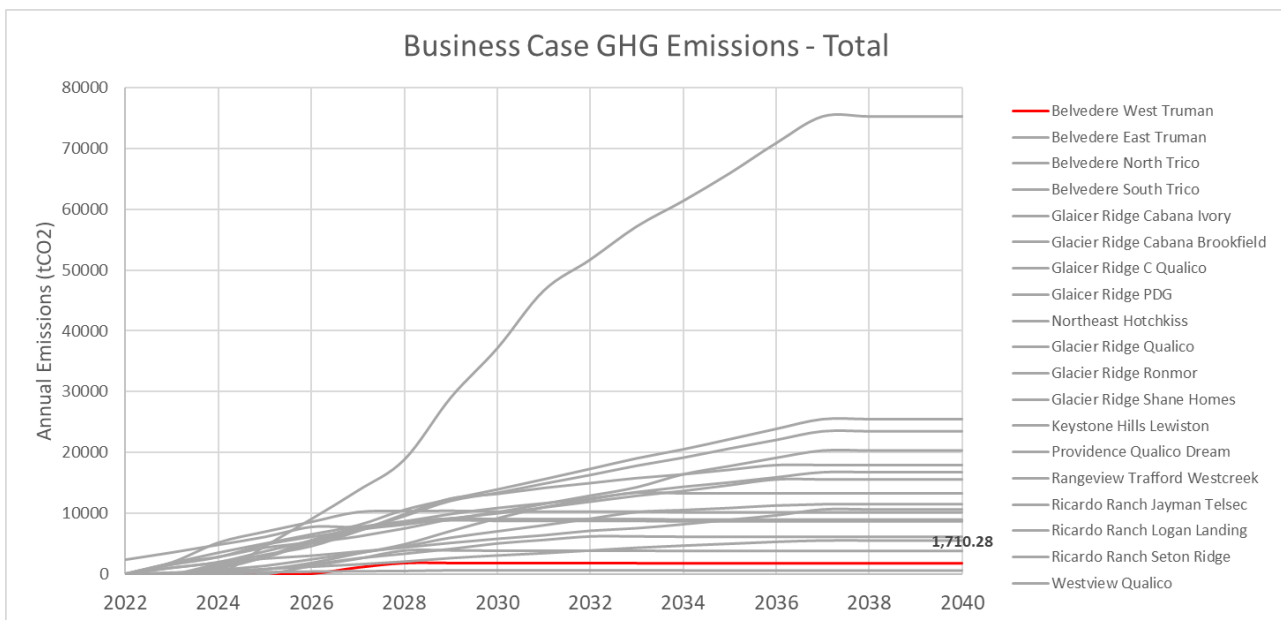
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

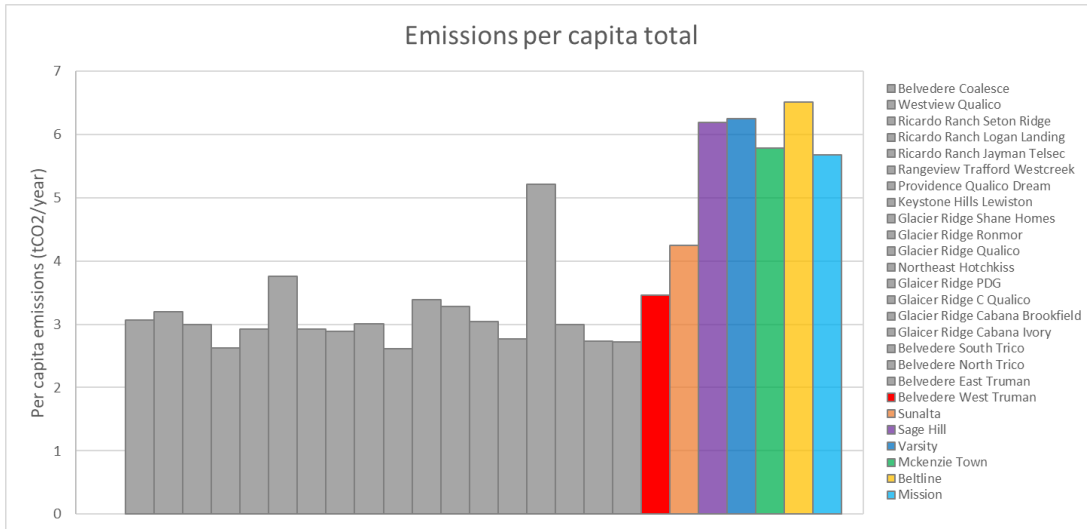


Airport travel are the largest contributors to amenity/work-based travel emissions at Belvedere West Truman. At full build out, Belvedere West Truman has an emission per capita from transportation of 1.20 tCO2 and annual emissions are forecasted to be 594.74 tCO2/year.

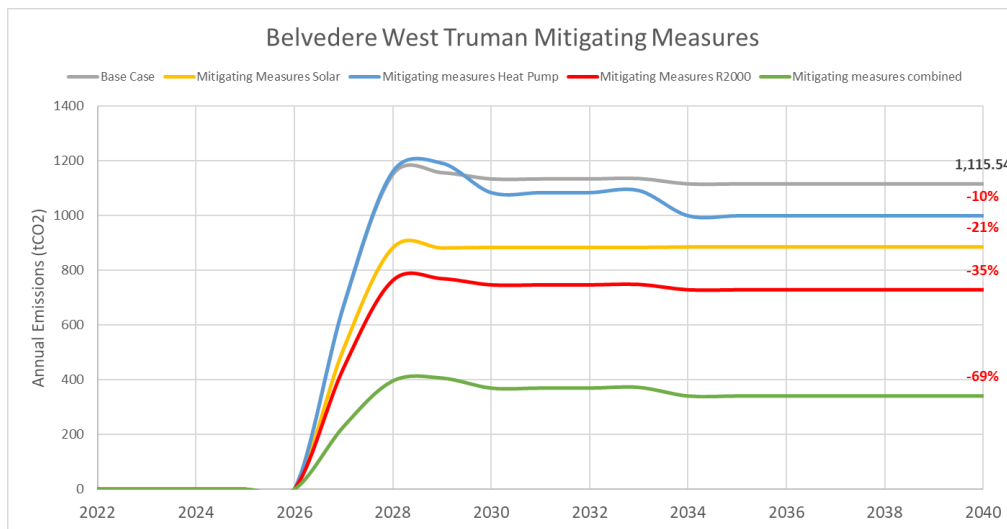
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 1,710.28 tCO2/year and 3.46 tCO2/capita at full build out. Estimated population at full build out is ~495 people.





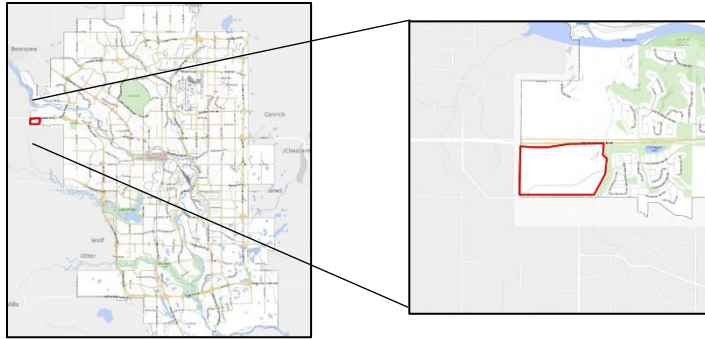
Mitigating measures - Buildings



Emissions from Belvedere West Truman can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation).

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 21% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 10% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 35% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 69%** from baseline, taking building emissions from 1,115.54 tCO2/year to 341.33 tCO2/year.



Westview Qualico is a mixed residential development situated in the north-west quadrant of the city that is planned to begin construction in the year 2023.

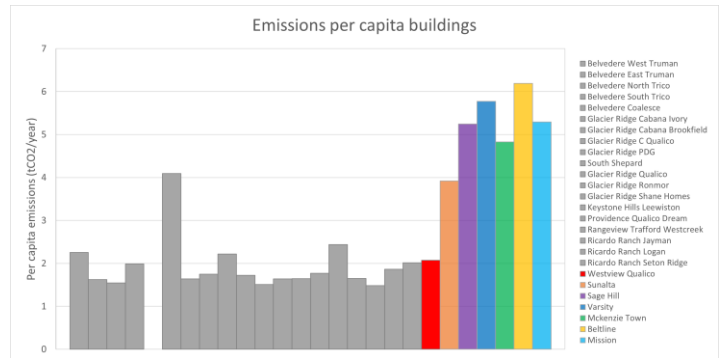
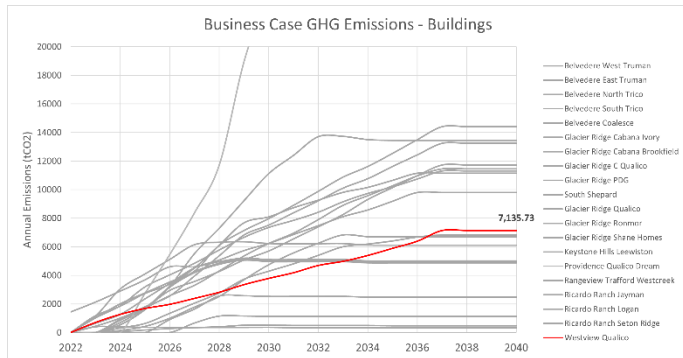
Construction Phasing

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Multi-family	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Single Family	0	120	100	0	0	0	31	90	90	70	90	50	90	90	90	86	0	0	0
Semi-detached	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	100	70	100	59	0	0	0	0	0	0	0	0	0	0	0	0
Office (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60,000	0	0	0
Retail (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial (sq.ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*Diverse housing offering stated, therefore assumes 25% of builds are townhomes

Greenhouse Gas emissions – Buildings

What we heard: Solar panels, tankless water heaters, above-code insulation, high efficiency furnaces, smart thermostats, heat recovery ventilators and triple pane windows are optional.

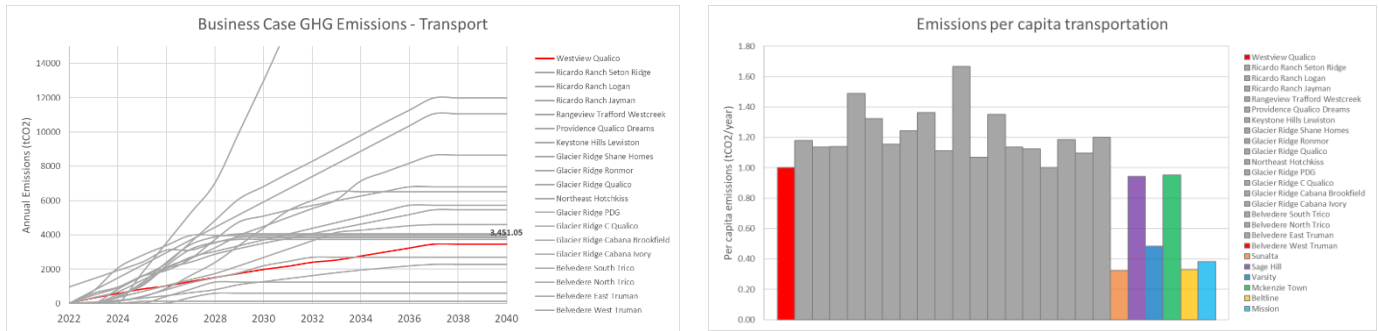


*Assumes natural gas emissions factor of 0.0561t/GJ and electricity emissions factor of 0.2tco2/MWh in 2040

At full build out, annual emissions from the operations of buildings at Westview Qualico are forecasted to be 7,135.73 tCO2/year, this equates to an emission per capita of 2.07 tCO2 at full build out. *Please note, data from existing communities is projected based on real consumption data (as opposed to modelled consumption) and therefore may not be entirely comparable.*

Greenhouse Gas emissions – Transportation

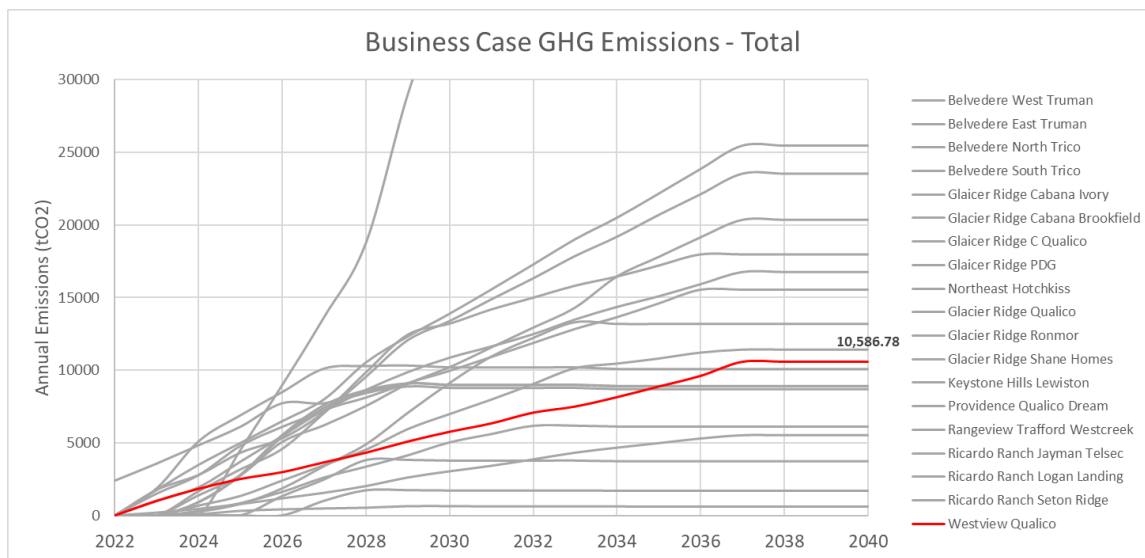
Transportation emissions results are calculated based on amenity and workplace related travel only - average Vehicle Kilometer Travel (VKT) and subsequent emissions data is generated based on travel to downtown, grocery stores, schools, parks, daycares, public transit, recreational facilities and the airport. As such this does not represent the total transportation emission profile of business case submissions and further emissions will likely occur through non-amenity-based travel.

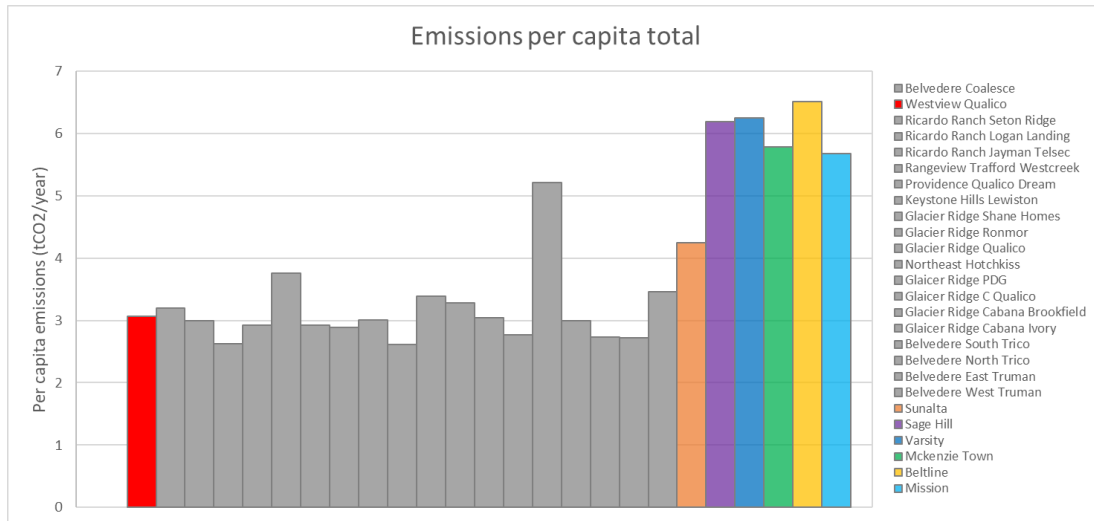


Downtown and airport travel are the largest contributors to amenity-based travel emissions at Westview Qualico. At full build out, Westview Qualico has an emission per capita from transportation of 1.00 tCO2 and annual emissions are forecasted to be 3,451.05 tCO2/year.

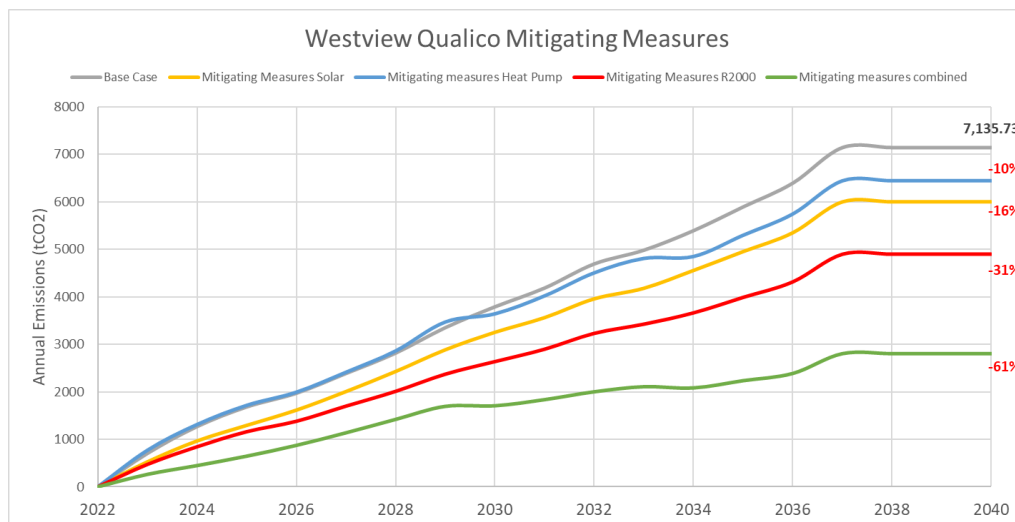
Greenhouse Gas emissions – Total

Total emissions combine emission profiles from both buildings and transportation. Combined emissions from both sectors result in 10,586.78 tCO2/year and 3.07 tCO2/capita at full build out. Estimated population at full build out is ~3450 people.





Mitigating measures



Emissions from Westview Qualico can be mitigated and reduced significantly if clean technology options are adopted, the graph above shows the emissions impact of adopting three different interventions: solar photovoltaic, heat pump technology and improved energy performance to R2000 standard (Mitigating measures through transportation are not supplied at this time as we recognize the limited control the proponent has over this aspect of emissions generation).

- Installation of solar panels and utilization of 100% of the average solar potential of the typical Calgary residence could result in a 16% reduction in emissions.
- Switching natural gas fired heating systems to heat pump technology could result in a 10% reduction in emissions.
- Improving the energy performance standard to align with the R2000 standard could result in a 31% reduction in emissions

Combined these measures could lead to an emissions **reduction potential of 61%** from baseline, taking building emissions from 7,135.73 tCO₂/year to 2,808.45 tCO₂/year.