

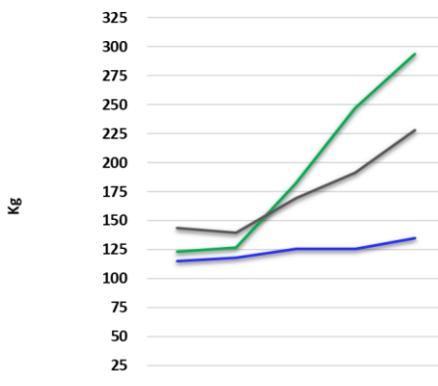
Residential Waste Collection Route Optimization

November 9, 2020



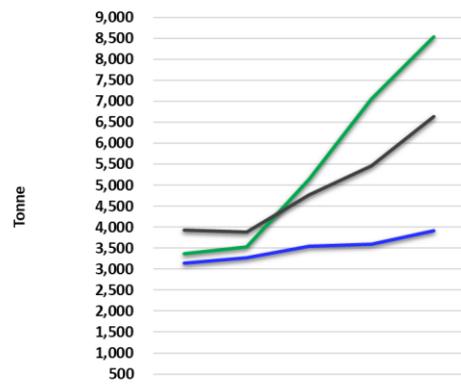
Collected Materials - By Stream

Per H/H Collection by Stream

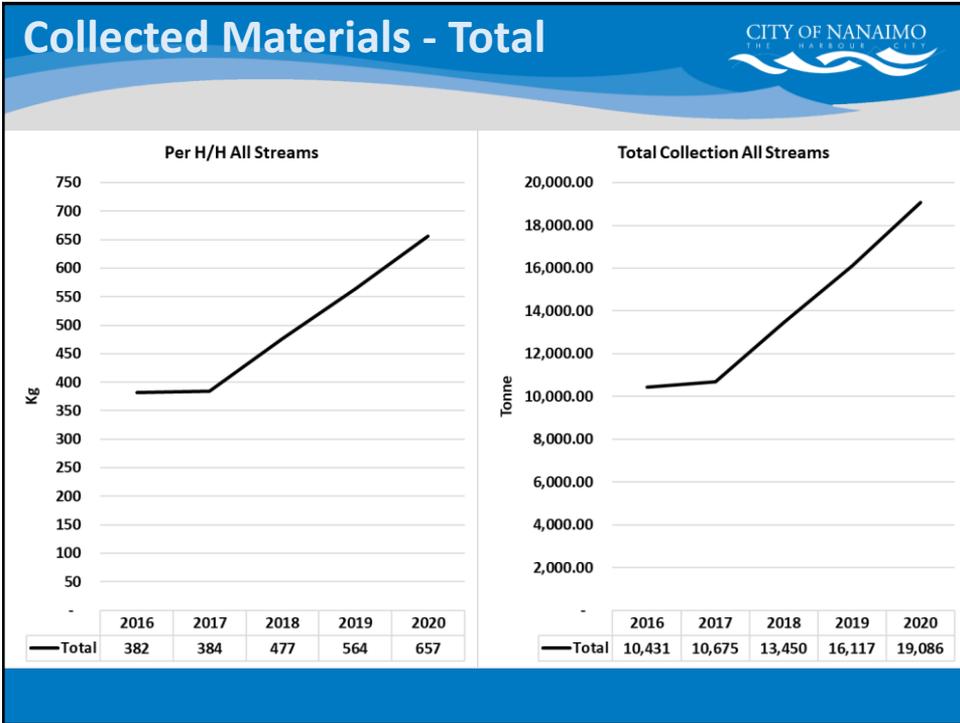


| | 2016 | 2017 | 2018 | 2019 | 2020 |
|----------------|------|------|------|------|------|
| Recyclables | 115 | 118 | 126 | 126 | 135 |
| Organics | 123 | 127 | 182 | 247 | 294 |
| Landfill Waste | 144 | 140 | 169 | 191 | 228 |

Total Collection by Stream



| | 2016 | 2017 | 2018 | 2019 | 2020 |
|----------------|-------|-------|-------|-------|-------|
| Recyclables | 3,138 | 3,277 | 3,541 | 3,592 | 3,917 |
| Organics | 3,365 | 3,522 | 5,141 | 7,059 | 8,537 |
| Landfill Waste | 3,928 | 3,877 | 4,768 | 5,467 | 6,633 |





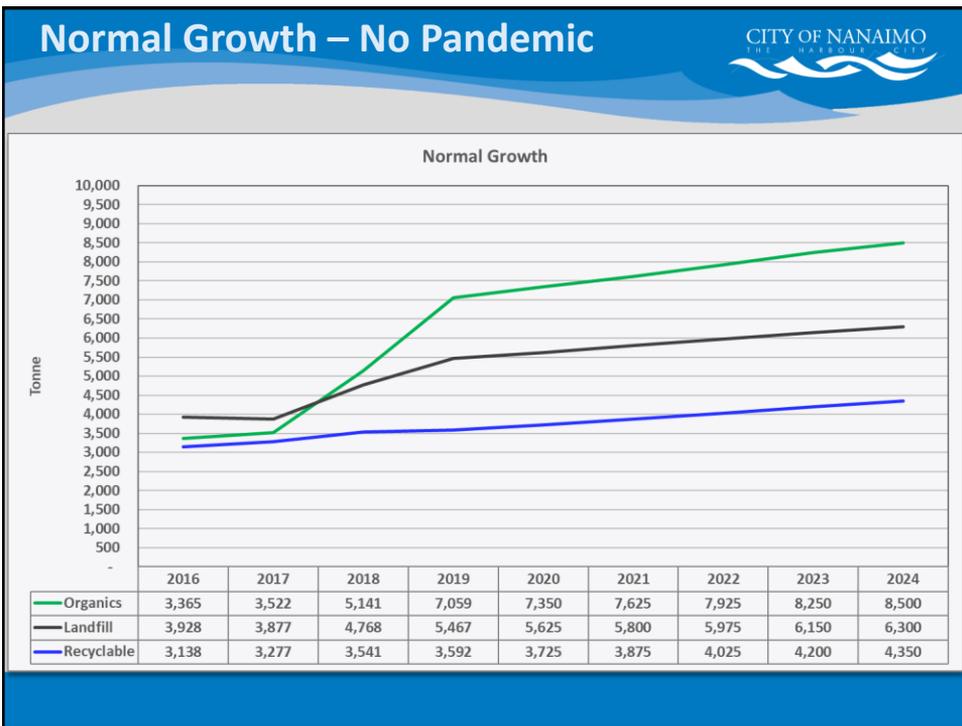
Pandemic Impact

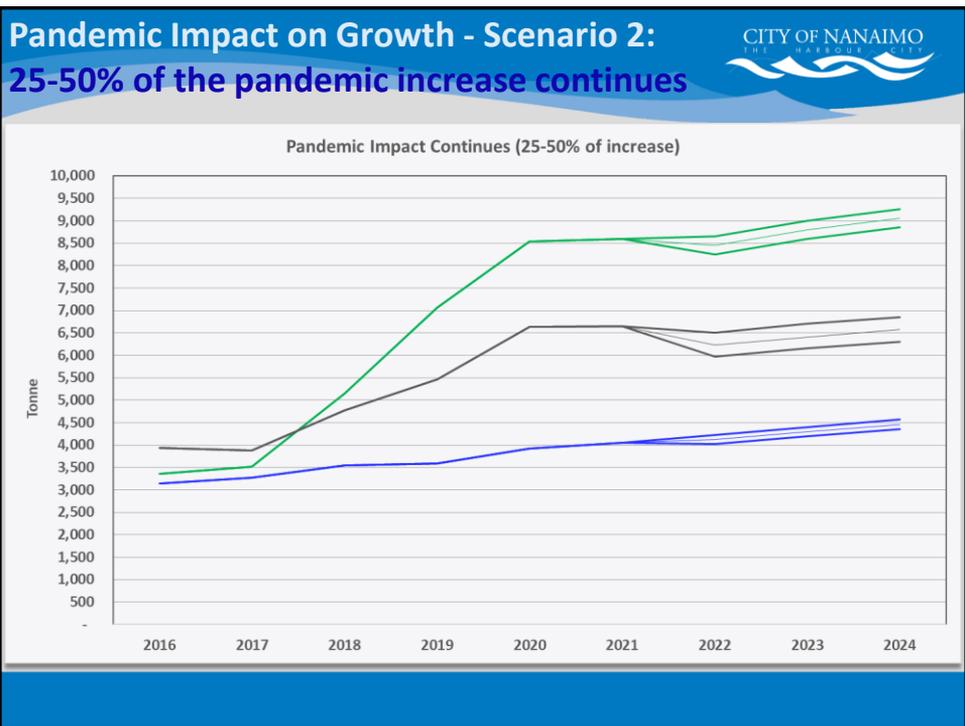
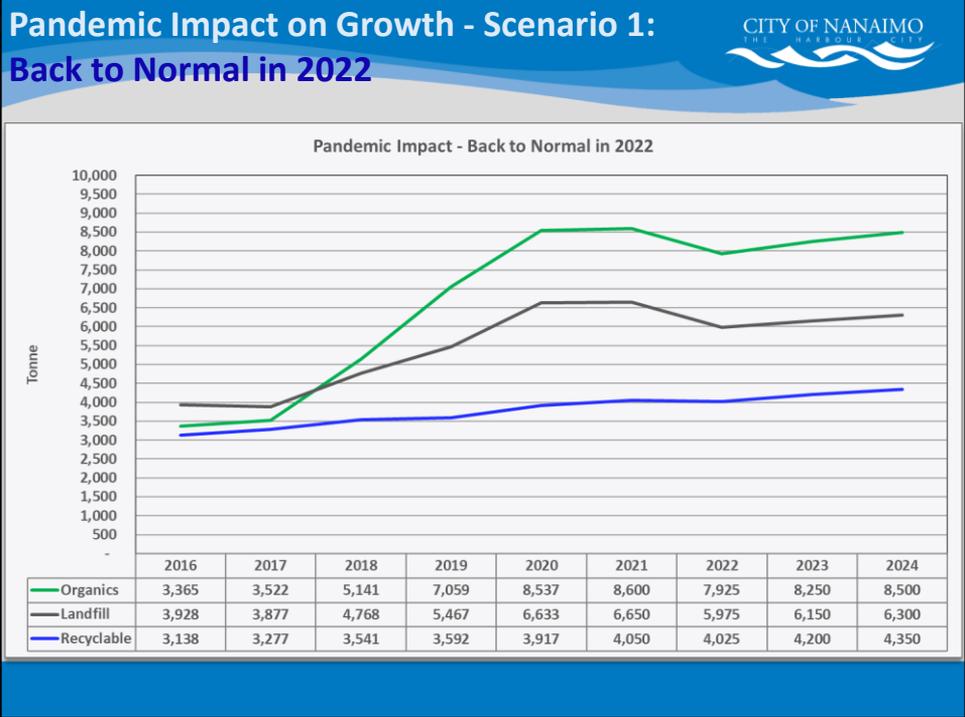


North America & Europe:
*Commercial waste has decreased.
 Waste has decreased in cities with high commercial and tourist activities.
 With more people at home, residential waste has increased across most cities. Some city's reported 45% increase, has overwhelmed collectors and increased contamination of recyclables.*

BC:
Other municipalities have experienced residential waste increases and commercial waste decrease.

RDN:
Commercial waste dropped, Residential and Self-haul increased





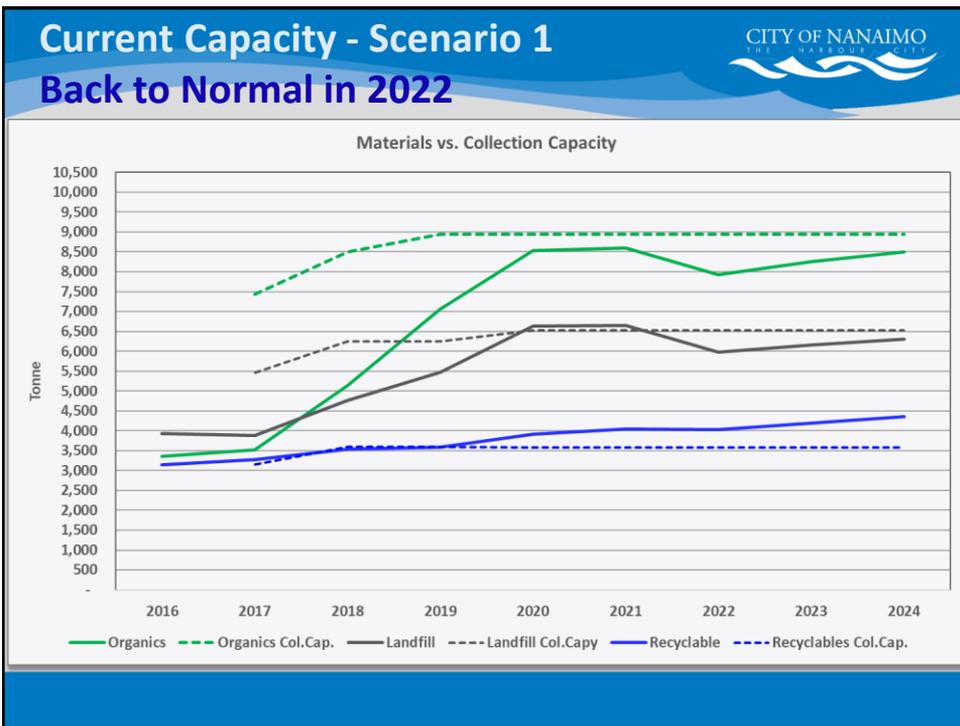
Current Operations

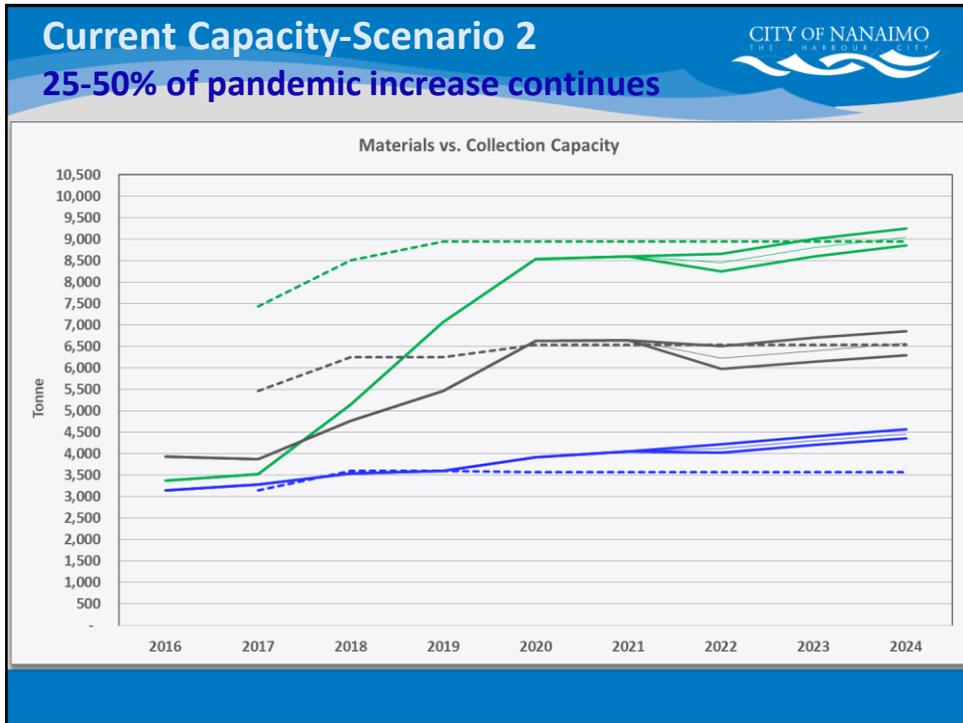


| | |
|---------------------------|--|
| Zones: | 5 |
| Routes: | 45 (same routes for both streams) |
| Tandem Axle Trucks | 8 |
| Single Axle Truck | 1 |
| Operators | 9 |

Annual Collection Capacity:

| | |
|-----------------------------|----------------------|
| Comingled Organics | 8,900 tonnes |
| Landfill Waste | 6,500 tonnes |
| Recyclable Materials | 3,600 tonnes |
| ----- | |
| Total | 19,000 tonnes |





Optimization

CITY OF NANAIMO
THE HARBOUR CITY

***Common solution to increase capacity is to add equal number of route(s) in each zone.
This will result in increased capacity for all streams.***

***Proposed plan separates the recyclables collection from landfill collection, and divides each zone into two independent collection routes.
This will result in increasing capacity where it is needed.***

Each zone:

- 5 landfill waste collection routes***
- 6 recyclable collection routes***

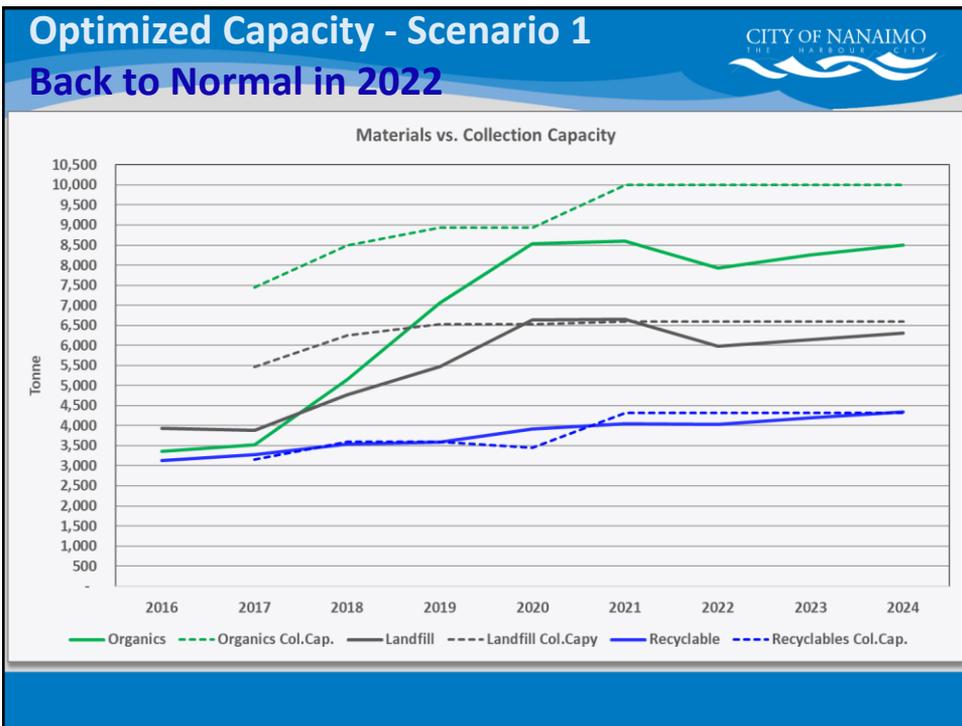
Optimized Operations

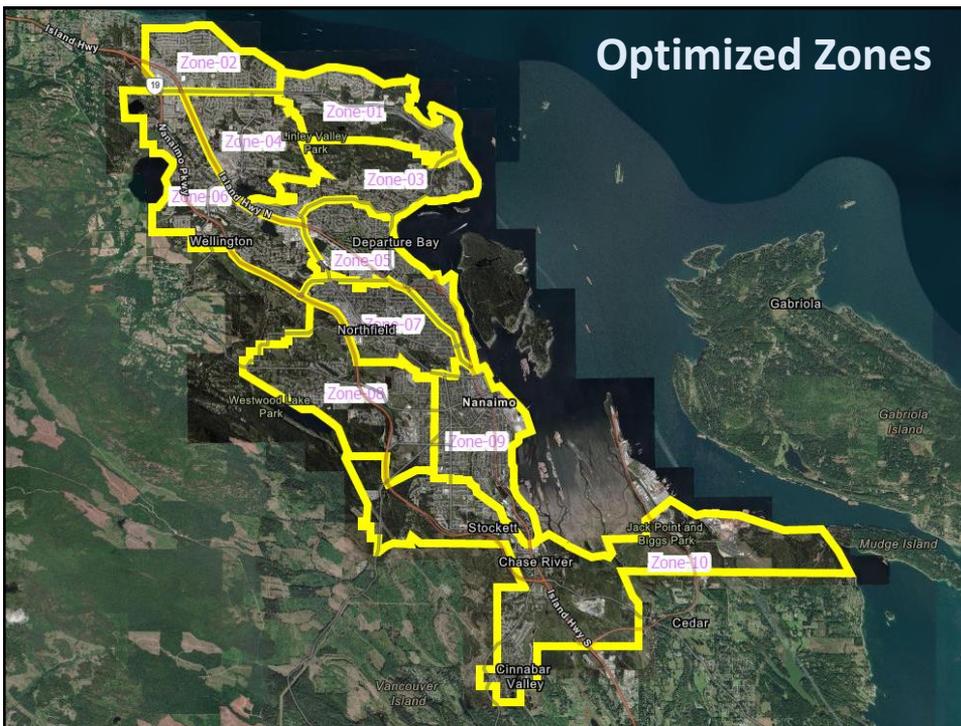
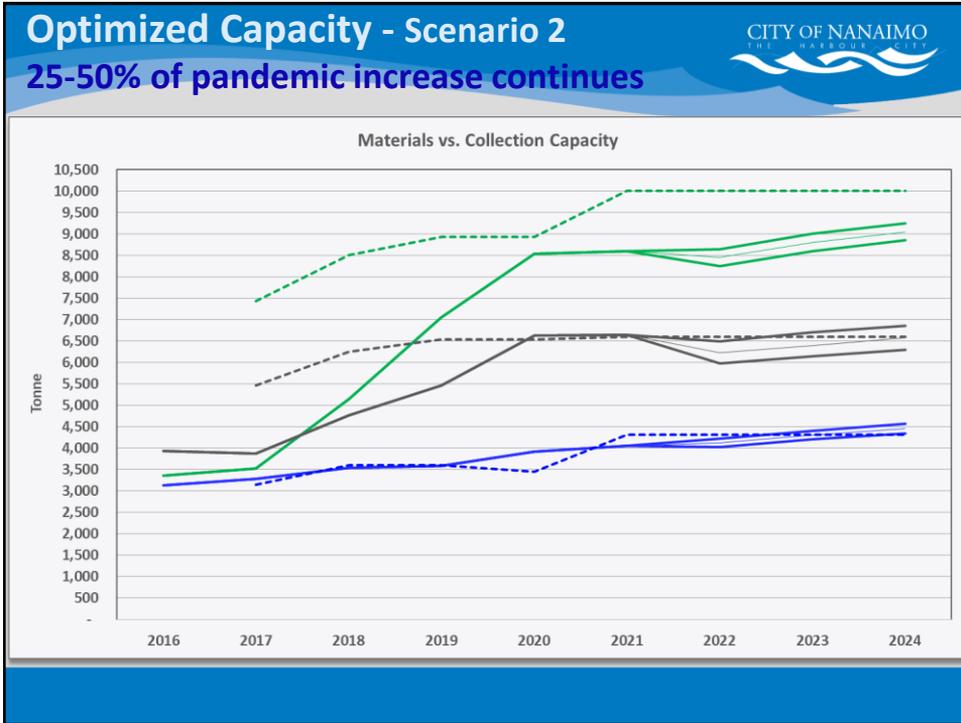


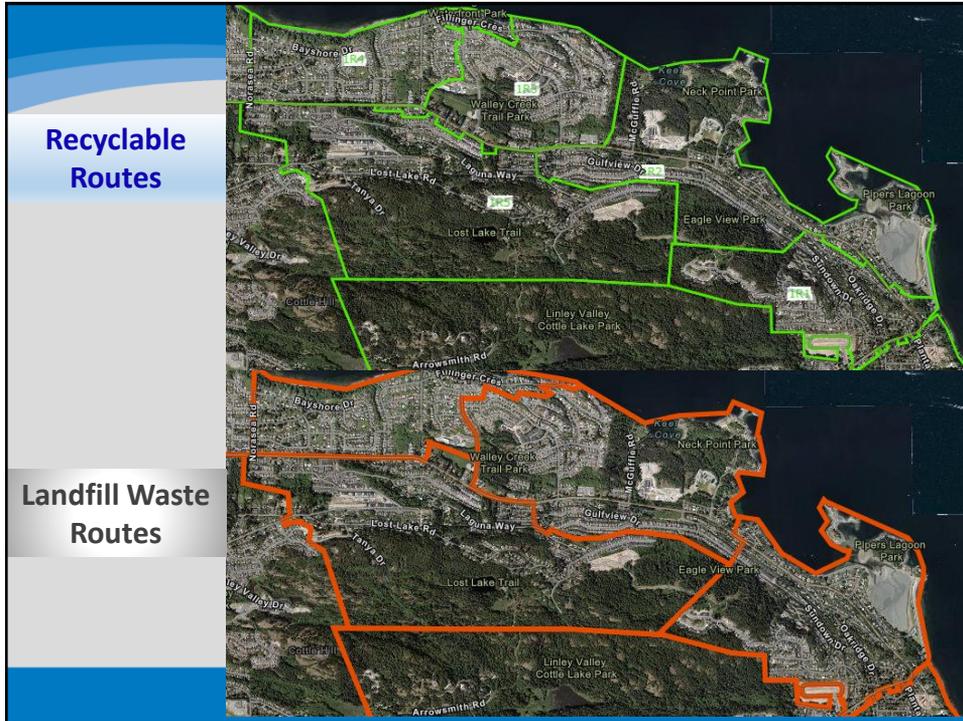
| | |
|---------------------------|---|
| Zones: | 10 |
| Routes: | 110 (50 landfill and 60 recyclables) |
| Tandem Axle Trucks | 9 |
| Single Axle Truck | 1 |
| Operators | 10 |

Annual Collection Capacity:

| | |
|-----------------------------|----------------------|
| Comingled Organics | 10,000 tonnes |
| Landfill Waste | 6,600 tonnes |
| Recyclable Materials | 4,300 tonnes |
| | |
| Total | 20,900 tonnes |







Advantage of Optimization



- Increases recyclables capacity 20% and organics capacity 10%.
- Maintains existing service level of curbside collection.
- Allows scheduling of adequate resources for each stream
- Balances the workload while demand for landfill waste collection to recyclable materials is imbalanced.
- Reduces time spent in line-up at disposal facilities.
- Reduces overtime.
- Provides future capacity for diversion rate increase.
- Allows future acquisition of specialized and more efficient equipment for each stream.

| Service User Experience - January | | | | | | | CITY OF NANAIMO THE HARBOUR CITY |
|-----------------------------------|---------|---------|---------|---------|----------------|--------------|-------------------------------------|
| January | | | | | | | |
| S | M | T | W | T | F | S | |
| | | | | | 1 | 2 | |
| | | | | | New Year's Day | | |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| | Route 4 | Route 5 | Route 1 | Route 2 | Route 3 | | |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| | Route 4 | Route 5 | Route 1 | Route 2 | Route 3 | 3R4,5R4 4 | |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | |
| Zone 1 | Zone 3 | Zone 5 | Zone 7 | Zone 9 | Zone 6 | Zone 3 | |
| 6R4 | Zone 4 | Zone 2 | Zone 8 | Zone 10 | Zone 4 | Zone 10 | |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
| Zone 2 | Zone 1 | Zone 2 | Zone 3 | Zone 4 | Zone 5 | | |
| Zone 5 | Zone 6 | Zone 7 | Zone 8 | Zone 9 | Zone 10 | | |
| 31 | | | | | | | |

| Service User Experience - 2021 | | | | | | | CITY OF NANAIMO THE HARBOUR CITY |
|--------------------------------|----|----|--------------------|----|----|----|-------------------------------------|
| March | | | | | | | |
| S | M | T | W | T | F | S | |
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| | 5 | 6 | Staff Training Day | 7 | 8 | | |
| | 10 | 1 | | 2 | 3 | | |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| | 9 | 10 | 1 | 2 | 3 | | |
| | 4 | 5 | 6 | 7 | 8 | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | |
| | 4 | 5 | 6 | 7 | 8 | | |
| | 9 | 10 | 1 | 2 | 3 | | |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | |
| | 9 | 10 | 1 | 2 | 3 | | |
| | 4 | 5 | 6 | 7 | 8 | | |
| 28 | 29 | 30 | 31 | | | | |
| | 4 | 5 | 6 | | | | |
| | 9 | 10 | 1 | | | | |

Summary



- Ten collection zones, each zone - six recycling and five garbage routes.
- Uses existing spare vehicle, until the new vehicle arrives in July 2022
- Accelerate hiring refuse collector to for January 2021, from July 2022
- Transition: January 16/17 and January 23/24, 2021
- No decrease in the level of service.
- \$6 increase per user in 2021.



Thank you!

Questions?