

The background of the slide features a blurred image of hands interacting with a tablet. Overlaid on this is a stylized line graph with a blue line and circular markers, and a red area chart. A large, light grey maple leaf is positioned in the upper center of the image.

Road Network Analysis

Now and in the future

Delivering insight through data, for a better Canada



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Statistique
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Who am I

- Reginald Maltais
- Work in the Statistical Geomatics Centre at Statistics Canada
- Unit Head for Research and Support, Spatial Data Infrastructure
- Product lead for National Road Network



@goatsweater



@reginaldmaltais

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Canada's Four Road Networks

- National Road Network (NRN)
- National Highway System (NHS)
- Canvec Transportation Features
- Road Network File (RNF)

Availability

| | NRN | NHS | Canvec | RNF |
|-----------------------|-----|-----|--------|-----|
| SHP | ☑ | | ☑ | ☑ |
| GML | ☑ | | | ☑ |
| KML | ☑ | | | |
| MapInfo (.tab) | | | | ☑* |
| FileGDB | | ☑ | ☑ | |
| GPKG | ☑ | | ☑* | |
| WMS | ☑ | ☑ | ☑ | |

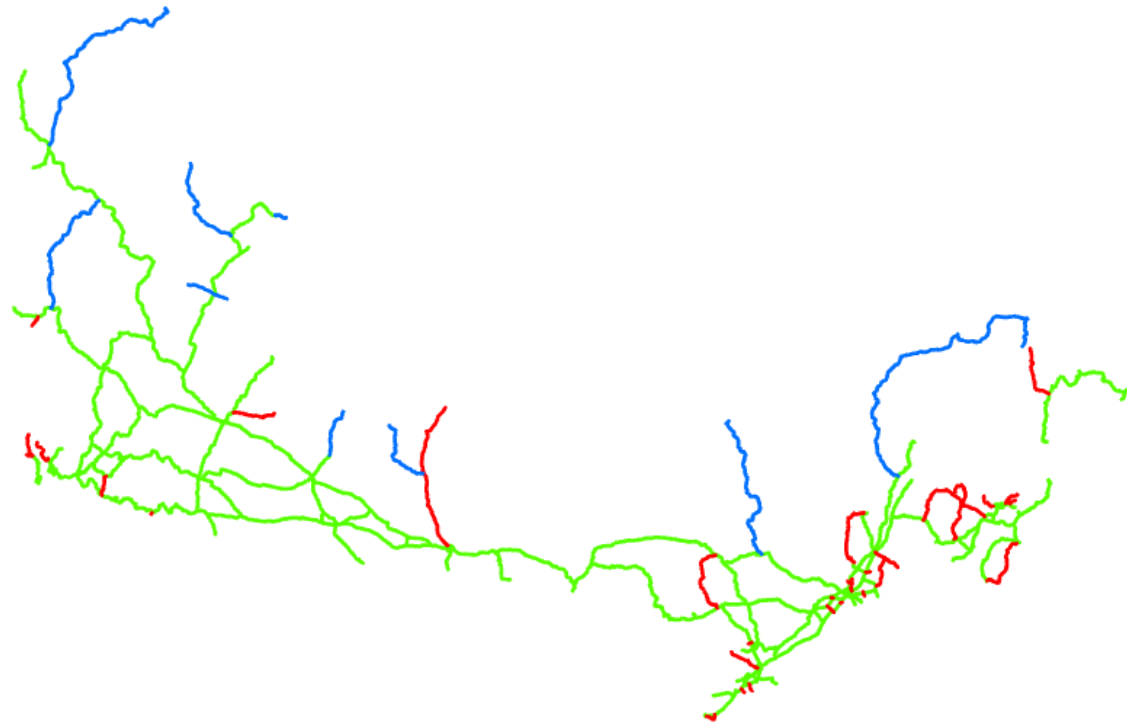
Why so many?

And what's the difference?

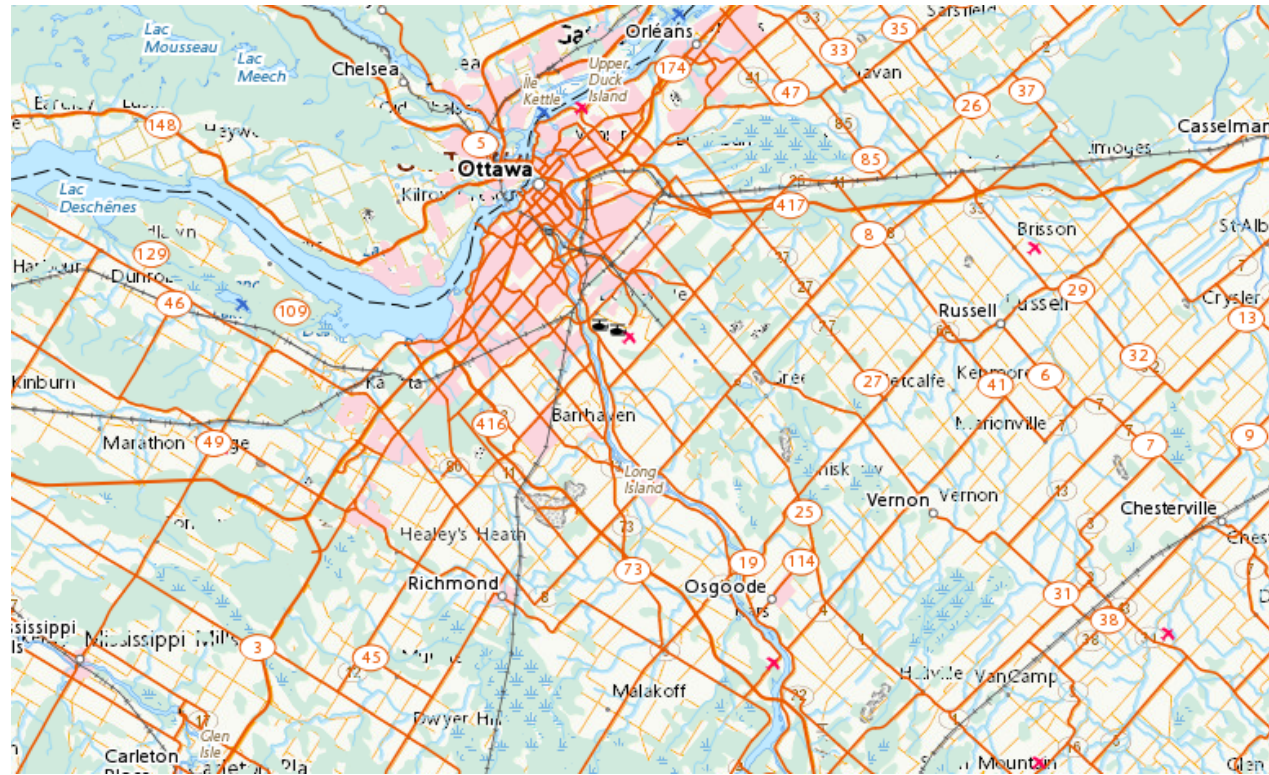
National Road Network (NRN)



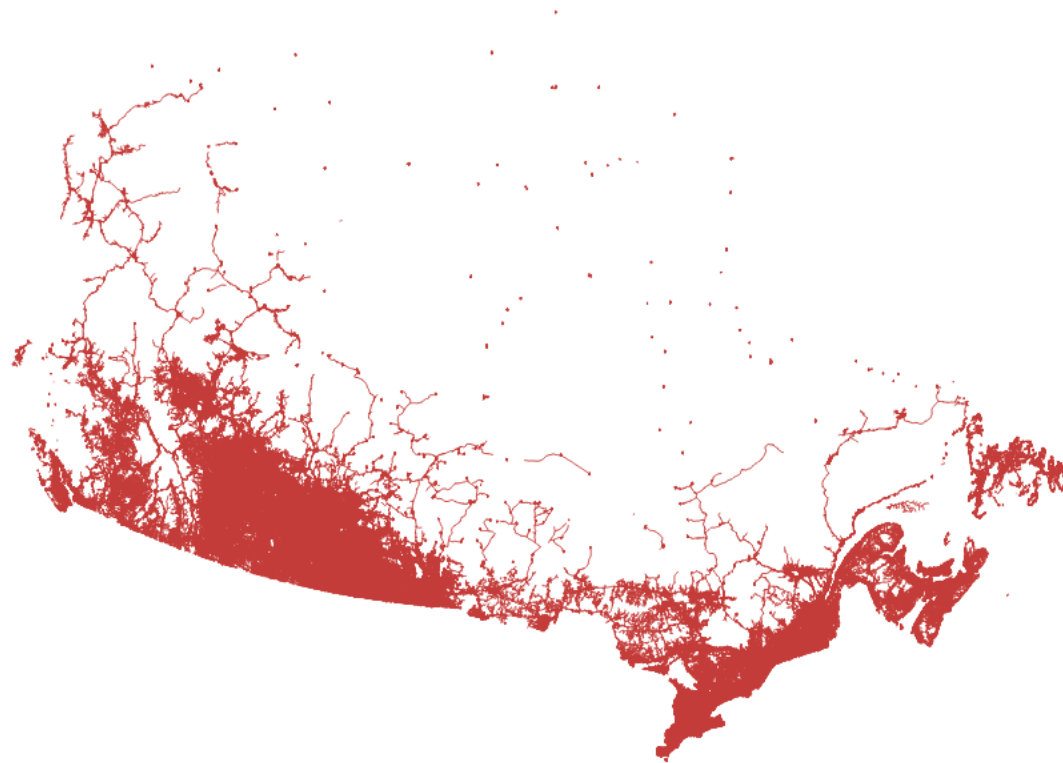
National Highway System (NHS)



CanVec Transportation Features



Road Network File (RNF)

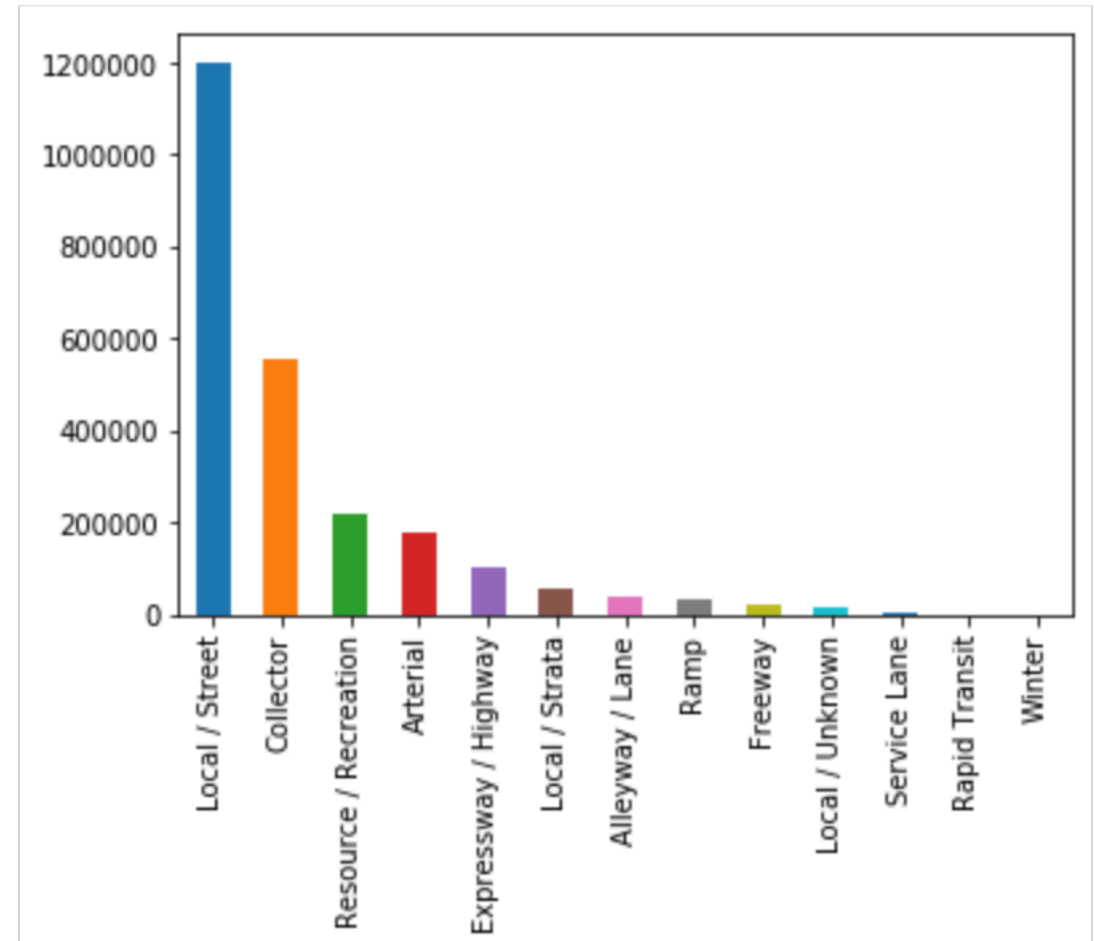


What can we do with them?

National Road Network (NRN)

```
In [10]: df['roadclass'].value_counts().plot(kind='bar')
```

executed in 295ms, finished 20:41:13 2019-05-20

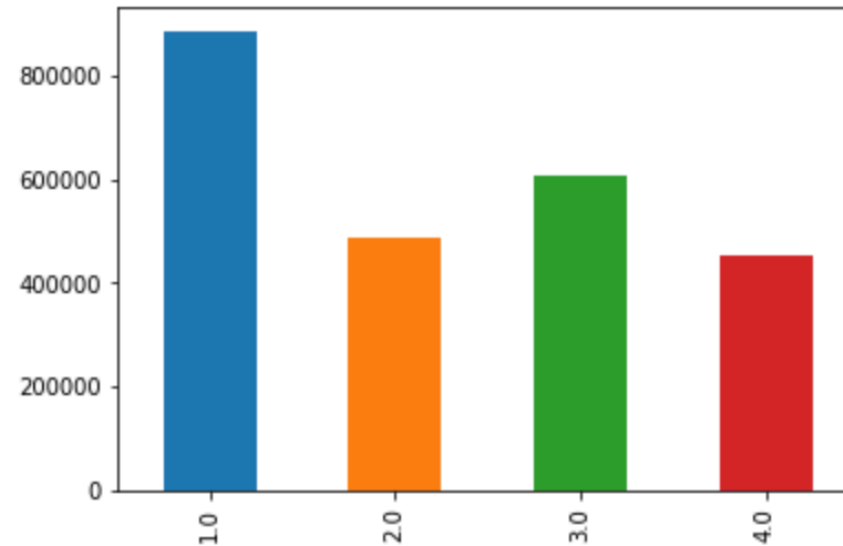


Dates of creation

```
In [46]: In [49]: # which quarter are things added in  
df['create2'].dt.quarter.value_counts().sort_index().plot(kind='bar')
```

executed in 311ms, finished 19:41:38 2019-06-10

```
Out[46]: Out[49]: <matplotlib.axes._subplots.AxesSubplot at 0x343ce5080>
```



Road surface types

```
In [12]: df['pavsta']
```

executed in 35ms

```
Out[12]: Paved  
Unpaved  
-1  
Name: pavsta, dtype: int64
```

```
In [13]: df['pavsurf'].value_counts()
```

executed in 32ms, finished 20:44:54 2019-05-20

```
Out[13]: Unknown    14688  
None              8241  
Flexible          1408  
Rigid              6  
Blocks            0  
Name: pavsurf, dtype: object
```

```
In [14]: df['unpavsurf'].value_counts()
```

executed in 30ms, finished 20:44:54 2019-05-20

```
Out[14]: None          1606448  
Unknown              523285  
Gravel               224406  
Dirt                  80259  
Name: unpavsurf, dtype: int64
```

Road structures and closing periods

```
In [15]: df['structtype'].value_counts()
```

executed in 39ms, finished 20:44:56 2019-05-20

```
Out[15]: None  
Bridge  
Tunnel  
Dam  
Bridge Moveable  
Bridge Covered  
Bridge Unknown  
Snowshed  
Name: structtype,
```

```
In [18]: df['closing'].value_counts()
```

executed in 26ms, finished 20:51:53 2019-05-20

```
Out[18]: Unknown      2387735  
Winter        33863  
None          12800  
Name: closing, dtype: int64
```

Street names and speed limits

```
In [22]: # how many have a different name on the
len(df[df['l_stname_c'] != df['r_stname_
executed in 1.52s, finished 20:54:53 2019-05-20
```

Out[22]: 171

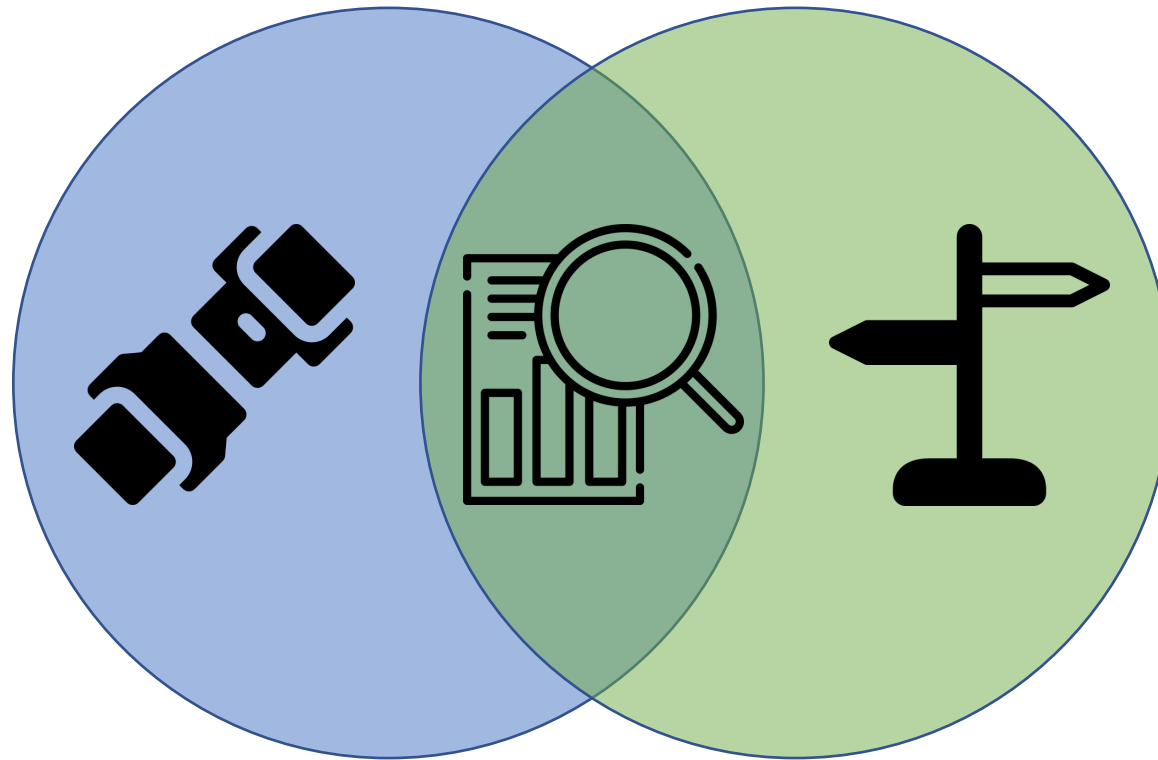
```
In [24]: # what is the most popular speed limit
df['speed'].value_counts().sort_index()
```

executed in 62ms, finished 20:55:44 2019-05-20

```
Out[24]: -1      1475998
          2           4
          5          128
          7           7
          8          19
         10         2345
         12           6
         15         1473
         16          15
         20         9565
         24           2
         25         2302
         28           2
         30         21482
         35          244
         40        136200
         45           16
         50        444970
         55           2
         60         40876
         65           13
         70         11186
         80        258252
         90         11268
        100         15527
        110          2496
```

Name: speed, dtype: int64

National Highway System (NHS)



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Canvec Transportation Features

Statistics by category :: Features Total: 9, Filtered: 9, Selected: 0

| | rdds_en | count | sum | mean | median |
|---|--------------------|-------|---------------|-----------|-----------|
| 1 | Resource-Recrea... | 1 | 56.94190 | 56.94190 | 56.94190 |
| 2 | Local-Unknown | 1 | 39.76118 | 39.76118 | 39.76118 |
| 3 | Alleyway-Lane | 2 | 300.32425 | 150.16212 | 150.16212 |
| 4 | Expressway-Highway | 7 | 889.49415 | 127.07059 | 32.03074 |
| 5 | Ramp | 17 | 493.65234 | 29.03837 | 33.53530 |
| 6 | Local-Strata | 94 | 8,900.14898 | 94.68244 | 62.65384 |
| 7 | Arterial | 108 | 9,826.10682 | 90.98247 | 68.35692 |
| 8 | Collector | 356 | 31,108.87590 | 87.38448 | 71.83600 |
| 9 | Local-Street | 1,808 | 204,222.60390 | 112.95498 | 95.26042 |

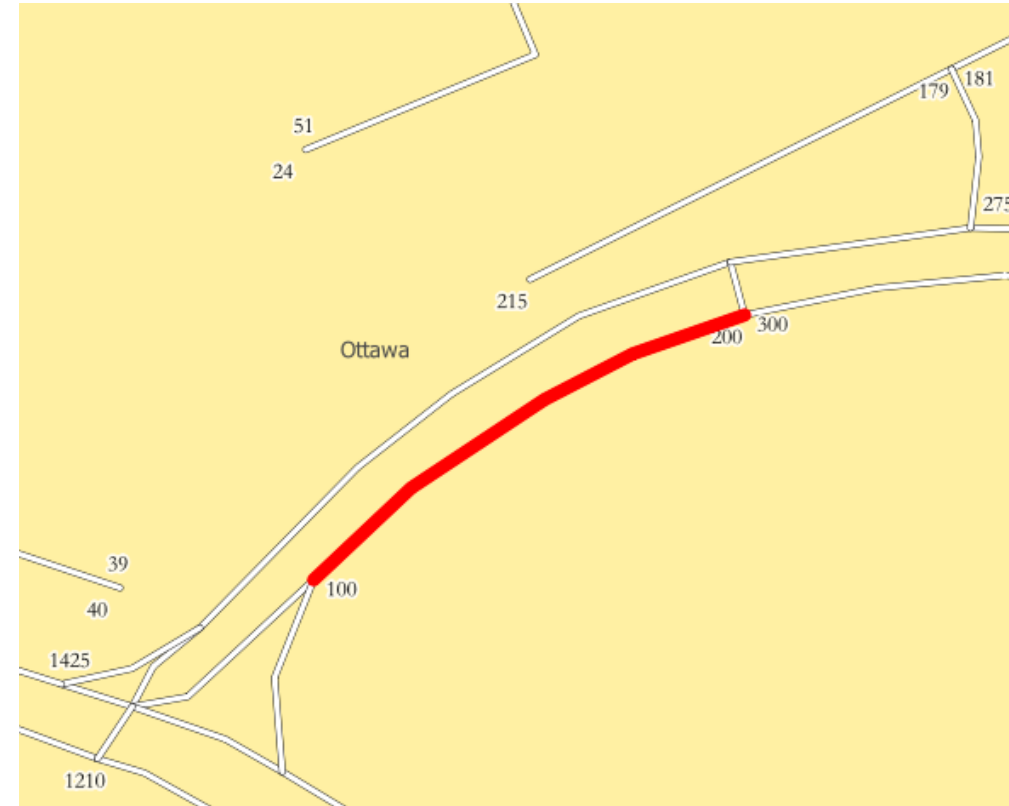
Show All Features

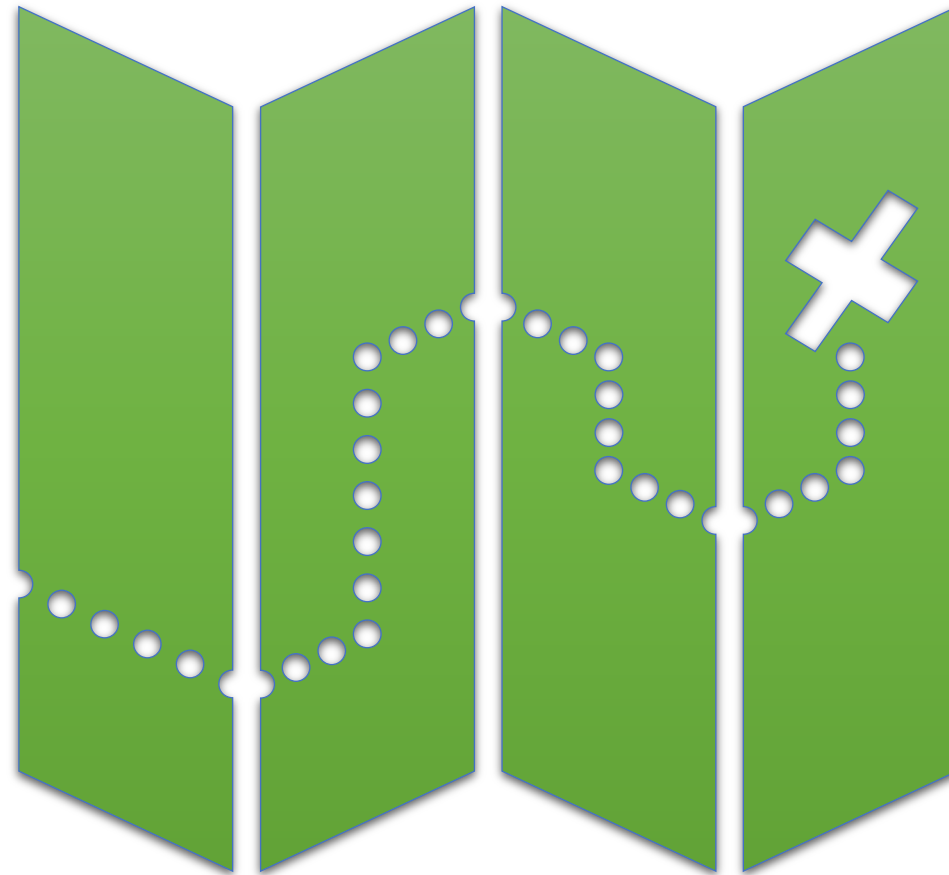


Road Network File (RNF)

```
SELECT CSDUID_L, CSDNAME_L, CSDUID_R, CSDNAME_R
FROM lrrnf000r16a_e
WHERE name = 'Coventry' AND type = 'RD'
AND ((afl_val::int <= 200 AND atl_val::int >= 200)
OR (afr_val::int <= 200 AND atr_val::int >= 200));
```

CSD == 3506008 (Ottawa)





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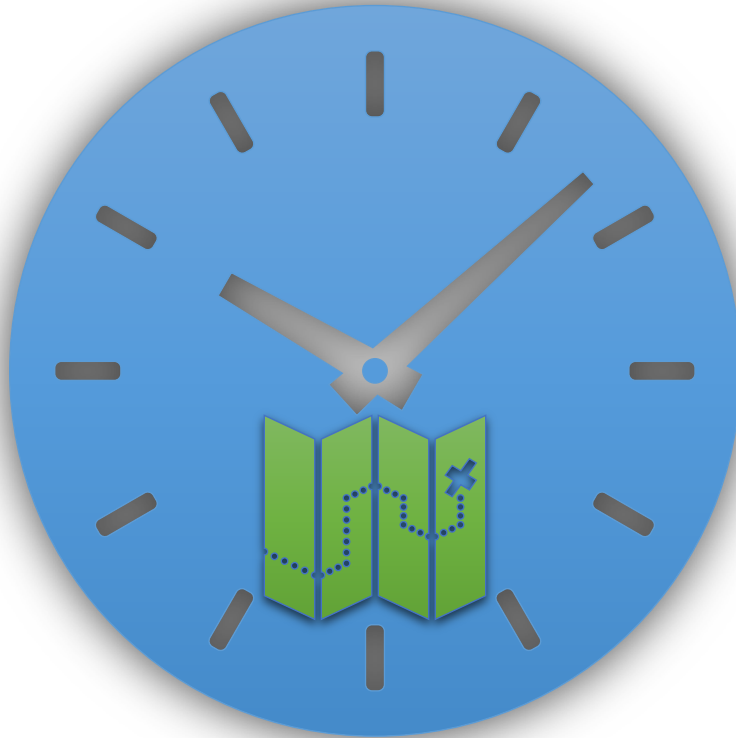
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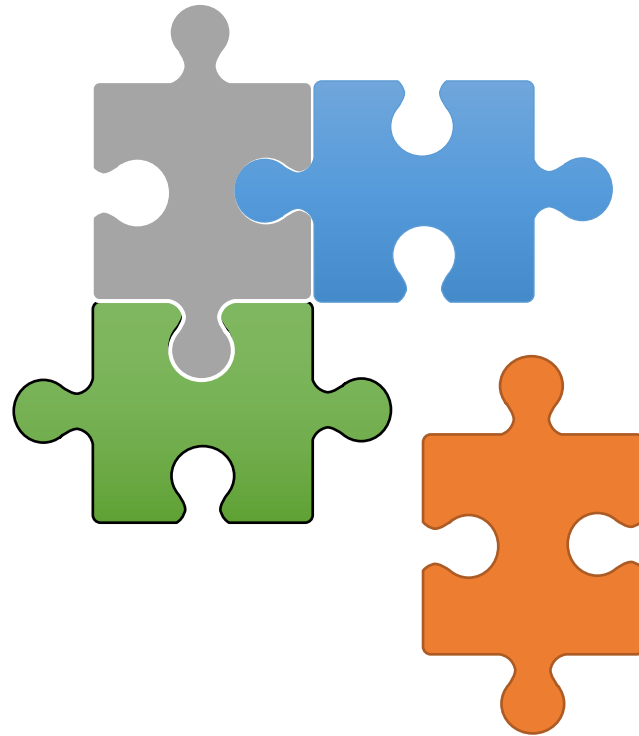
User Centric



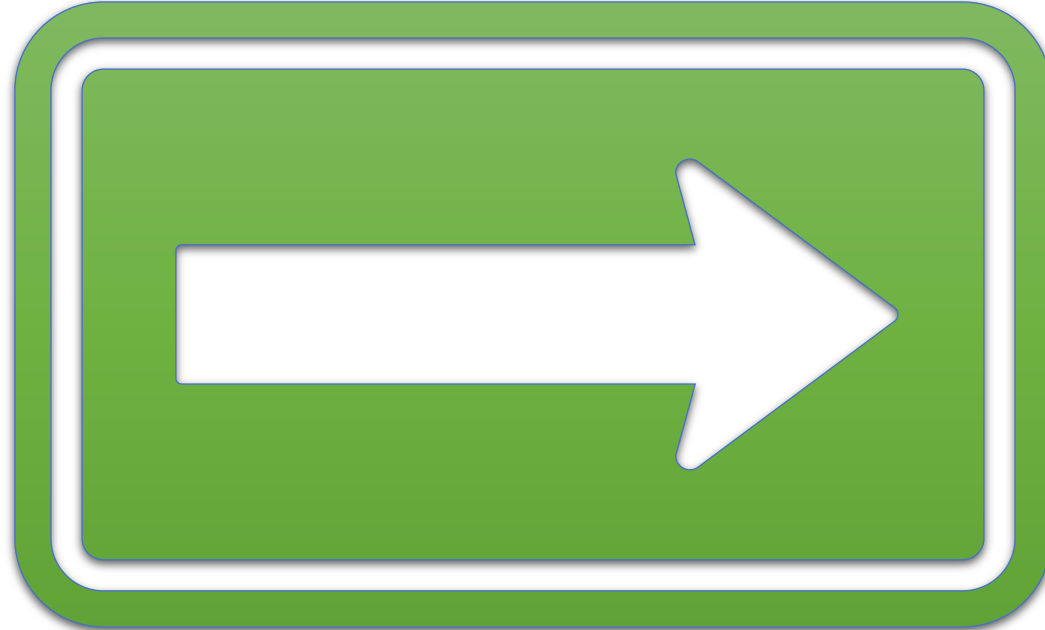
Timely updates from additional sources



Collaborative approach



Plan to sunset RNF after Census 2021



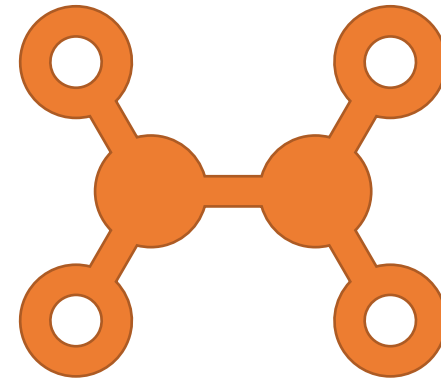
We'd be happy to work with you

Ongoing consultation

<https://www.statcan.gc.ca/eng/consultation/2019/nrn>

[GCcollab.ca](https://gcollab.ca)

Search "National Road Network"



Questions?

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