

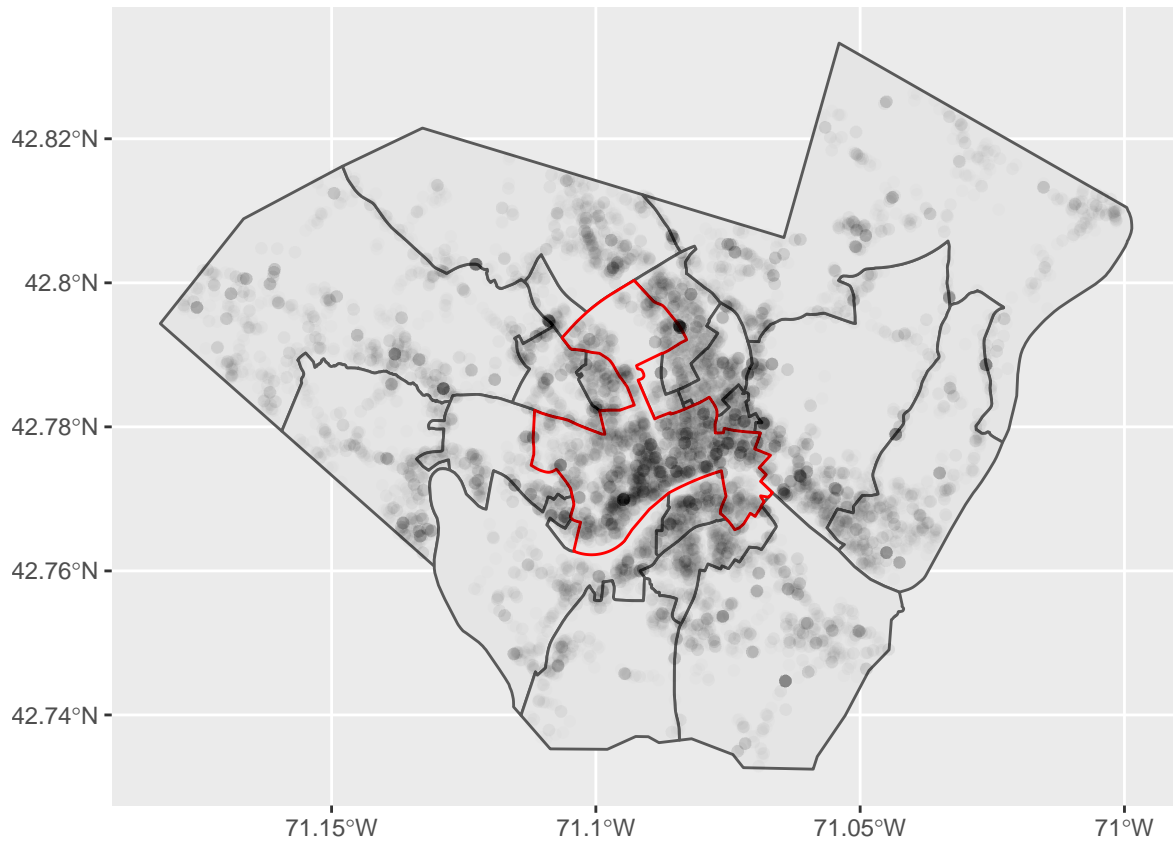
Haverhill_EDA

Haverhill Jing-Yu Team

The Haverhill dataset

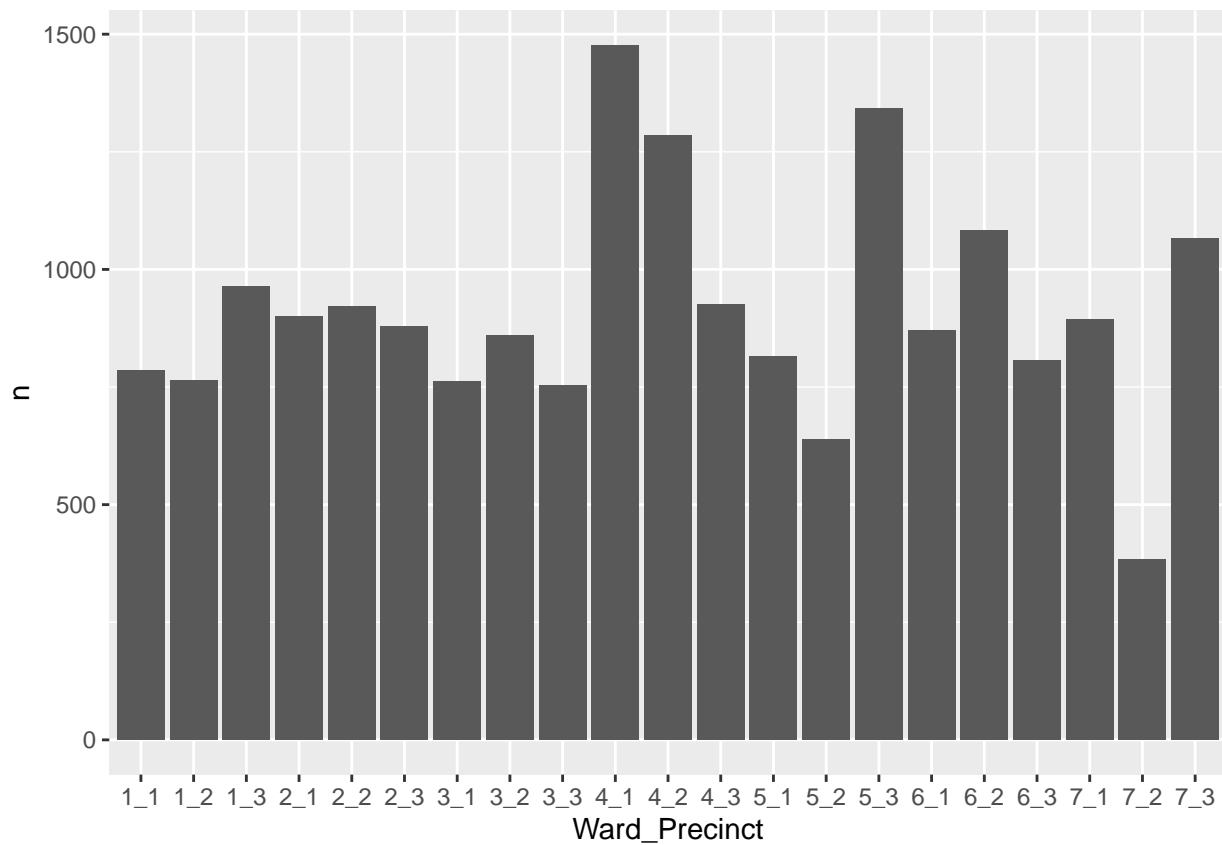
```
## # A tibble: 19,178 x 37
##   Request_ID Create_Date Master_Request Has_Links Status Status_Code
##   <dbl> <chr>          <dbl> <lgl>    <chr>      <dbl>
## 1      5130 1/3/17 13:~          0 FALSE    Closed        1
## 2      5140 1/3/17 14:~          0 FALSE    Closed        1
## 3      5142 1/3/17 14:~          0 FALSE    Closed        1
## 4      5143 1/3/17 14:~          0 FALSE    In Pr~        3
## 5      5145 1/3/17 14:~          0 FALSE    Closed        1
## 6      5147 1/3/17 15:~          0 FALSE    Closed        1
## 7      5149 1/3/17 15:~          0 FALSE    Closed        1
## 8      5165 1/3/17 16:~          0 FALSE    Closed        1
## 9      5167 1/3/17 16:~          0 FALSE    Closed        1
## 10     5173 1/3/17 17:~          0 FALSE    Closed        1
## # ... with 19,168 more rows, and 31 more variables: Last_Action <chr>,
## #   Last_Change <chr>, Close_Date <chr>, Work_Order_Created <lgl>,
## #   Request_Type_ID <dbl>, Request_Type <chr>, Request_Type_Private <lgl>,
## #   Request_Type_Info <chr>, Department_ID <dbl>, Department <chr>,
## #   Address_Number <chr>, Street_ID <dbl>, Street <chr>, Address <chr>,
## #   Complete_Address <chr>, City_ID <dbl>, City <chr>, Cross_Street_ID <dbl>,
## #   Cross_Street <chr>, District_ID <dbl>, District <chr>, Escalations <dbl>,
## #   Priority <dbl>, Longitude <dbl>, Latitude <dbl>, Origin_ID <dbl>,
## #   Origin <chr>, Ward <chr>, Ward_Precinct <chr>, Polling_Station_Name <chr>,
## #   CDBG <int>
## Linking to GEOS 3.7.2, GDAL 2.4.2, PROJ 5.2.0
```

The Heatmap of Requests



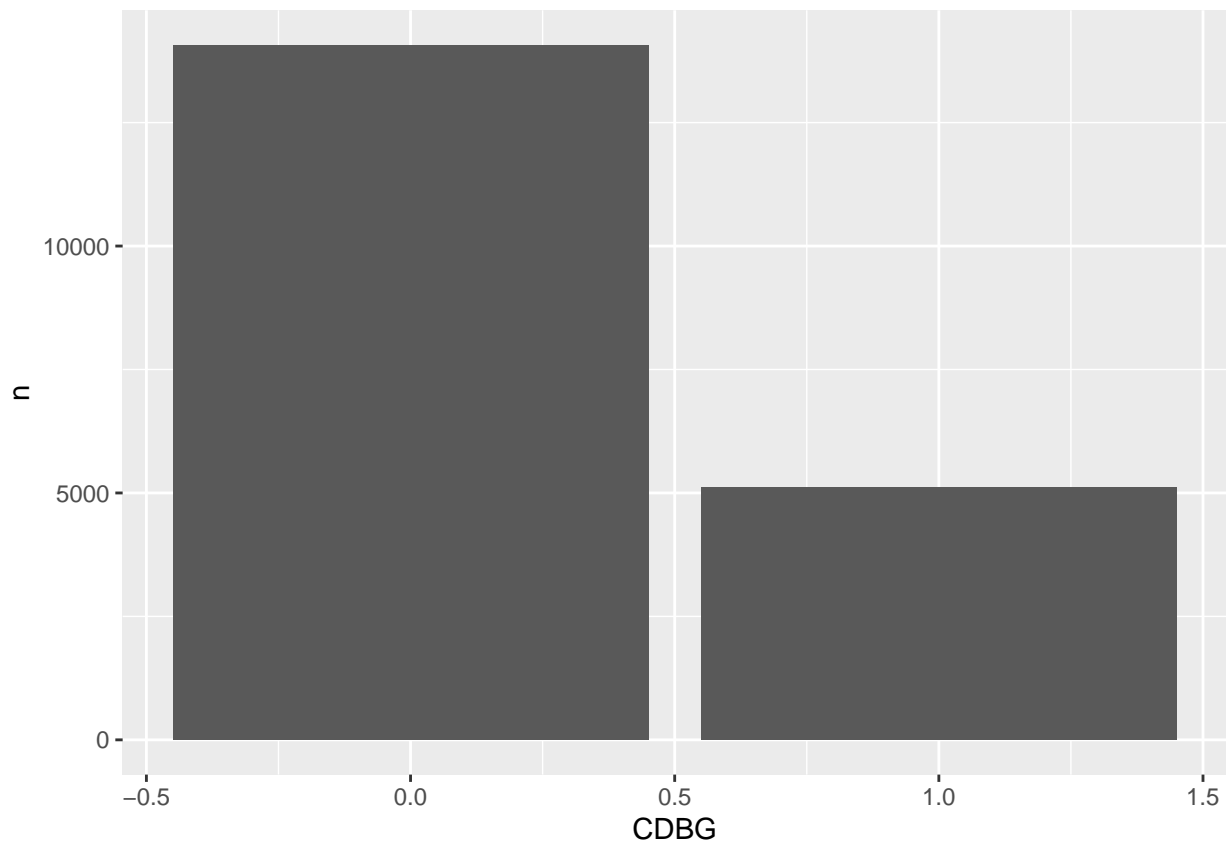
The Number of Requests per Ward&Precinct

```
## # A tibble: 21 x 2
##   Ward_Precinct    n
##   <chr>          <int>
## 1 4_1             1477
## 2 5_3             1343
## 3 4_2             1285
## 4 6_2             1082
## 5 7_3             1066
## 6 1_3              965
## 7 4_3              925
## 8 2_2              921
## 9 2_1              901
## 10 7_1             893
## # ... with 11 more rows
```



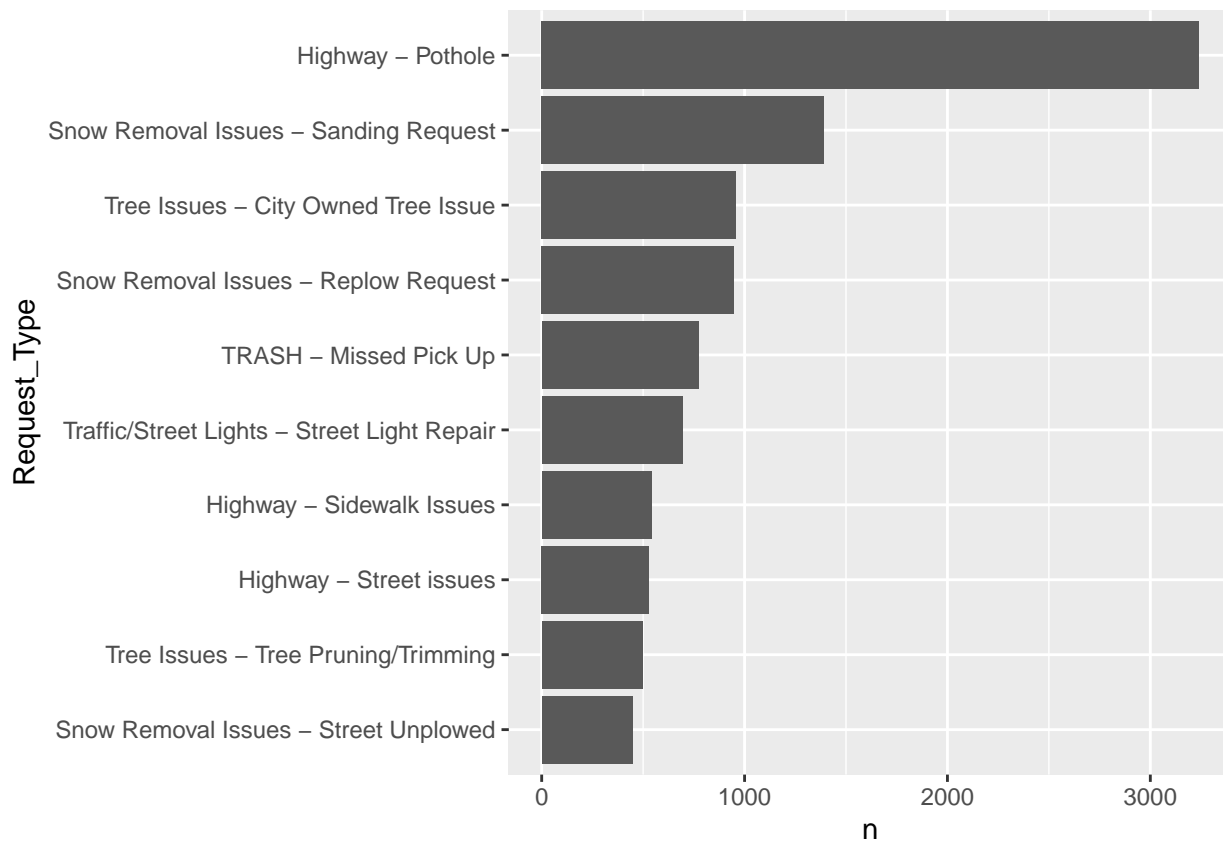
The Number of Requests in CDBG

```
## # A tibble: 2 x 2
##   CDBG      n
##   <int> <int>
## 1     0 14071
## 2     1  5107
```



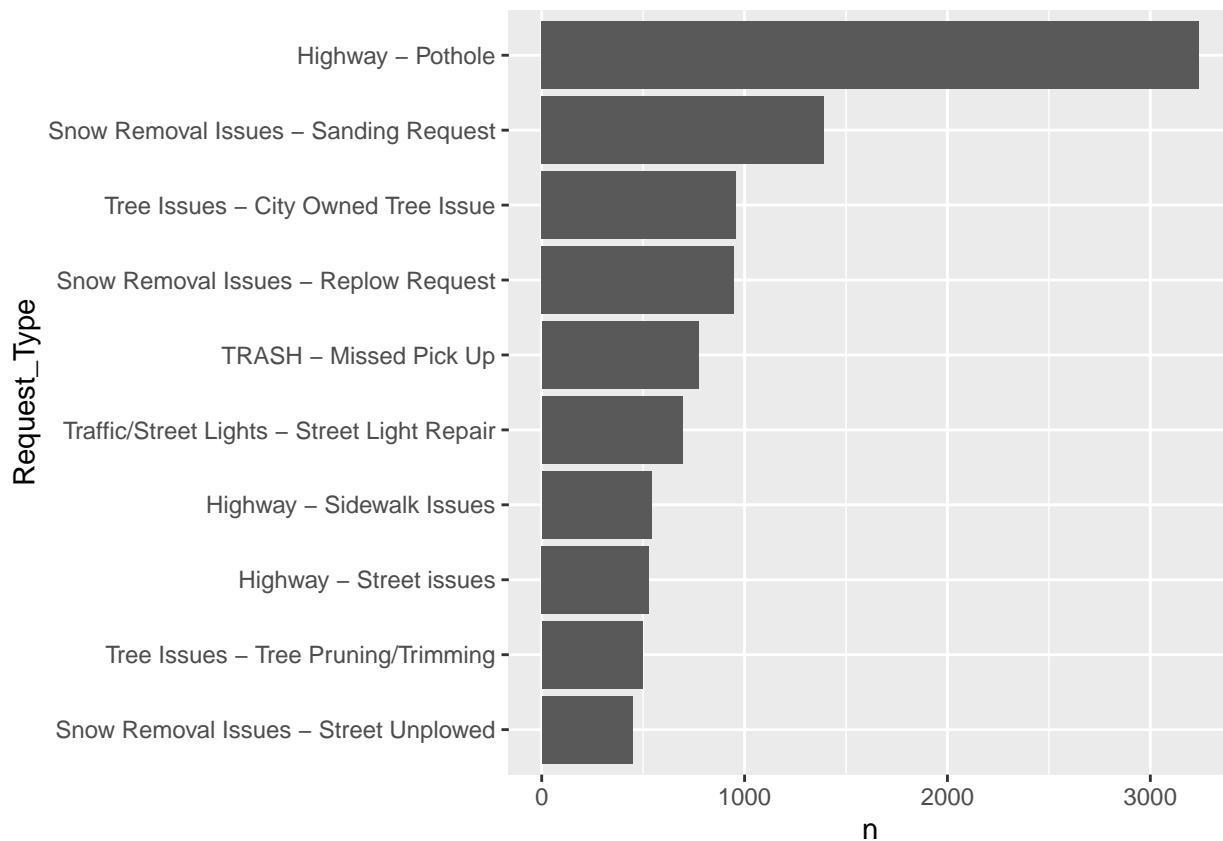
Haverhill Request Type Frequency

```
## # A tibble: 162 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      3241
## 2 Snow Removal Issues - Sanding Request    1393
## 3 Tree Issues - City Owned Tree Issue     957
## 4 Snow Removal Issues - Replow Request     947
## 5 TRASH - Missed Pick Up       772
## 6 Traffic/Street Lights - Street Light Repair 695
## 7 Highway - Sidewalk Issues      542
## 8 Highway - Street issues       529
## 9 Tree Issues - Tree Pruning/Trimming     497
## 10 Snow Removal Issues - Street Unplowed    448
## # ... with 152 more rows
```



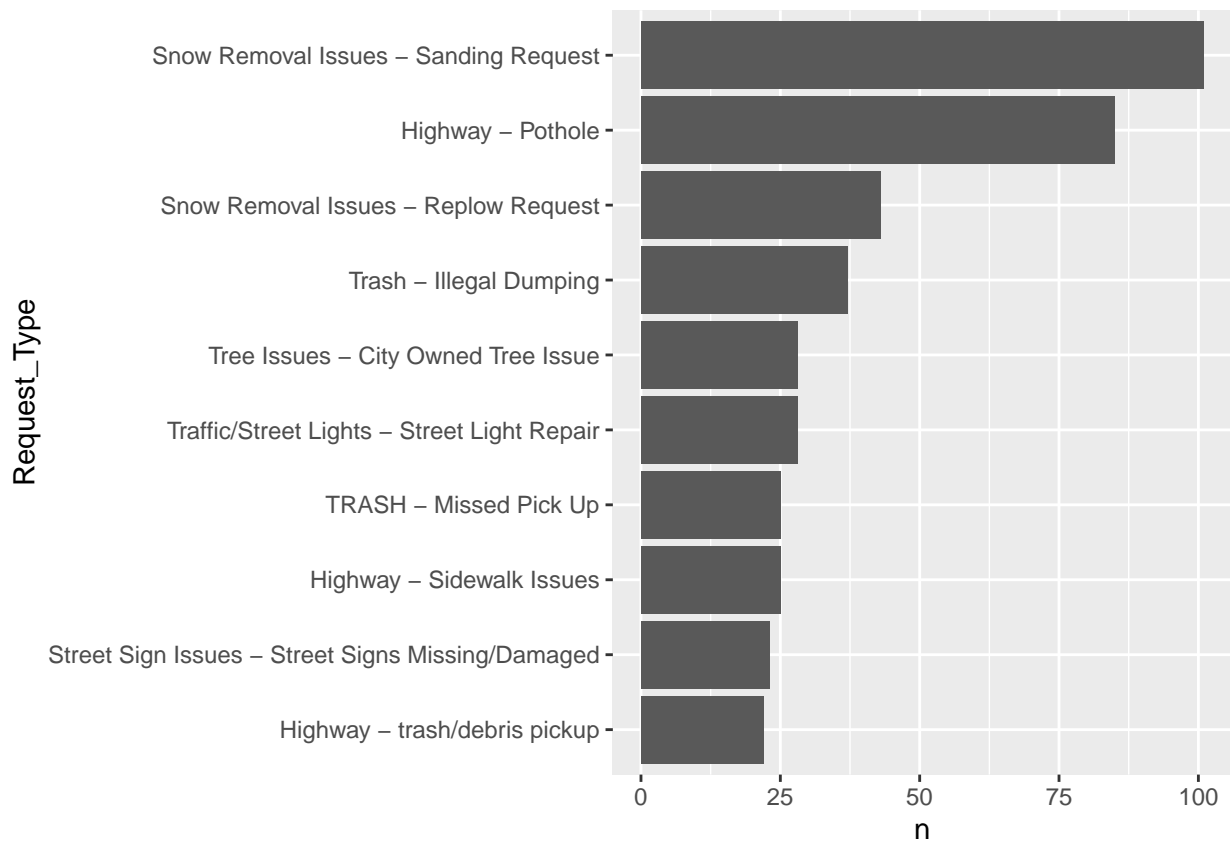
Haverhill CDBG Request Type Frequency

```
## # A tibble: 162 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      3241
## 2 Snow Removal Issues - Sanding Request    1393
## 3 Tree Issues - City Owned Tree Issue      957
## 4 Snow Removal Issues - Replow Request      947
## 5 TRASH - Missed Pick Up      772
## 6 Traffic/Street Lights - Street Light Repair  695
## 7 Highway - Sidewalk Issues      542
## 8 Highway - Street issues      529
## 9 Tree Issues - Tree Pruning/Trimming      497
## 10 Snow Removal Issues - Street Unplowed     448
## # ... with 152 more rows
```



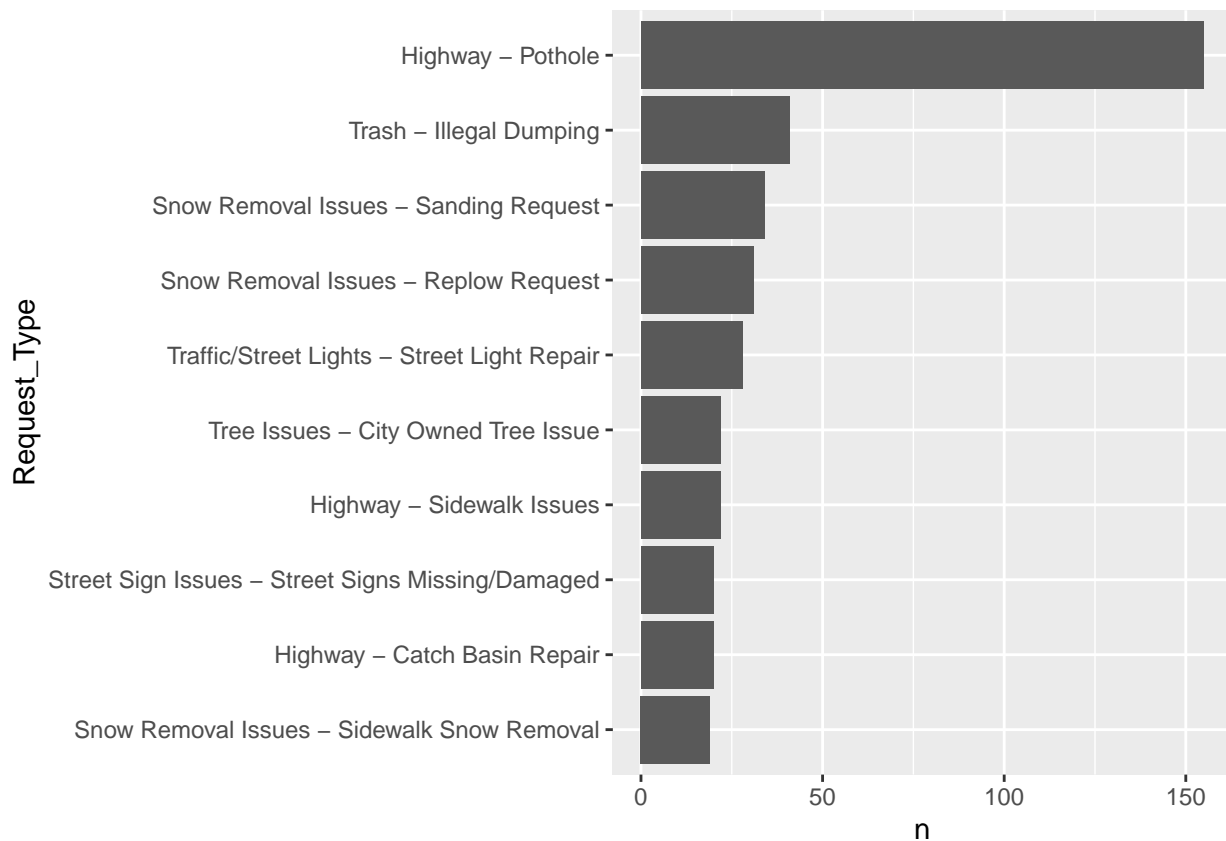
Haverhill Ward&Precinct 1-1 Request Type Frequency

```
## # A tibble: 99 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Snow Removal Issues - Sanding Request    101
## 2 Highway - Pothole                        85
## 3 Snow Removal Issues - Replow Request     43
## 4 Trash - Illegal Dumping                  37
## 5 Traffic/Street Lights - Street Light Repair 28
## 6 Tree Issues - City Owned Tree Issue       28
## 7 Highway - Sidewalk Issues                 25
## 8 TRASH - Missed Pick Up                   25
## 9 Street Sign Issues - Street Signs Missing/Damaged 23
## 10 Highway - trash/debris pickup           22
## # ... with 89 more rows
```



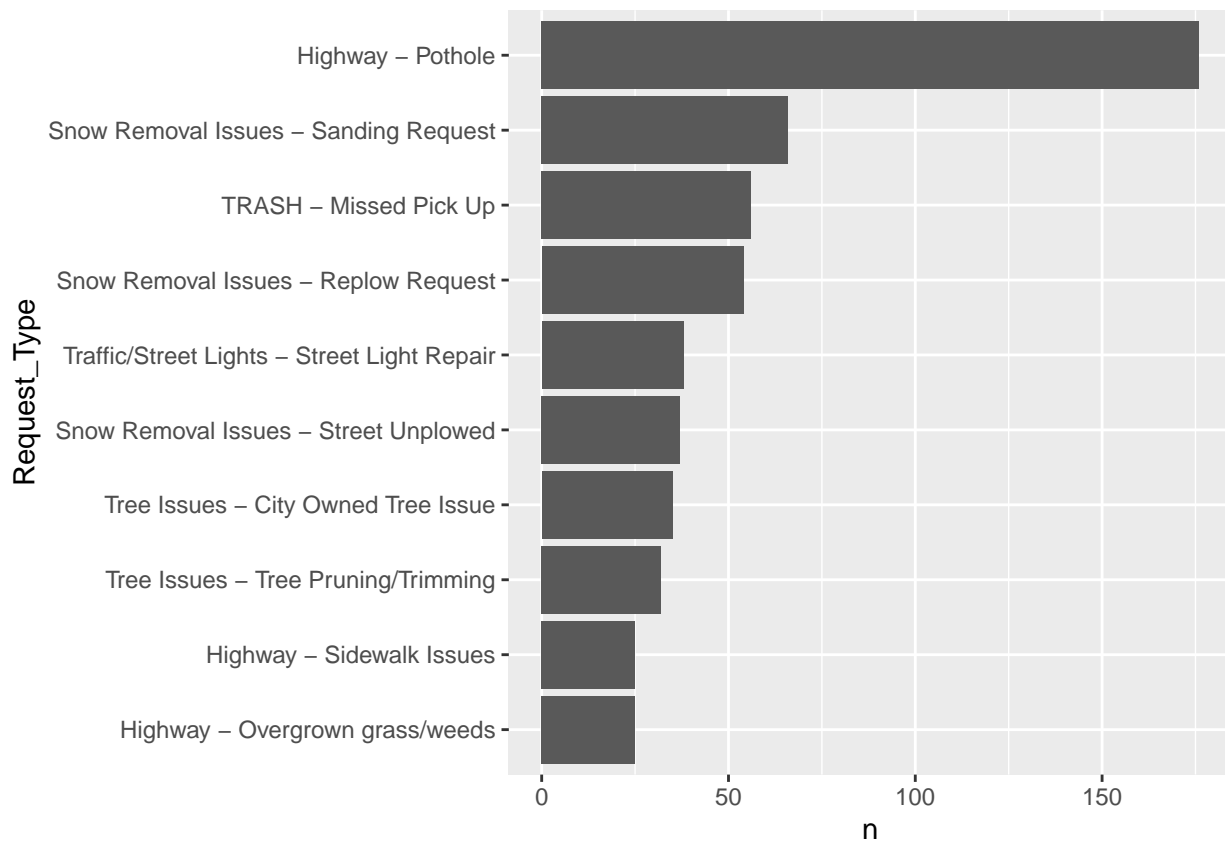
Haverhill Ward&Precinct 1-2 Request Type Frequency

```
## # A tibble: 100 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      155
## 2 Trash - Illegal Dumping    41
## 3 Snow Removal Issues - Sanding Request    34
## 4 Snow Removal Issues - Replow Request    31
## 5 Traffic/Street Lights - Street Light Repair    28
## 6 Highway - Sidewalk Issues    22
## 7 Tree Issues - City Owned Tree Issue    22
## 8 Highway - Catch Basin Repair    20
## 9 Street Sign Issues - Street Signs Missing/Damaged    20
## 10 Snow Removal Issues - Sidewalk Snow Removal    19
## # ... with 90 more rows
```



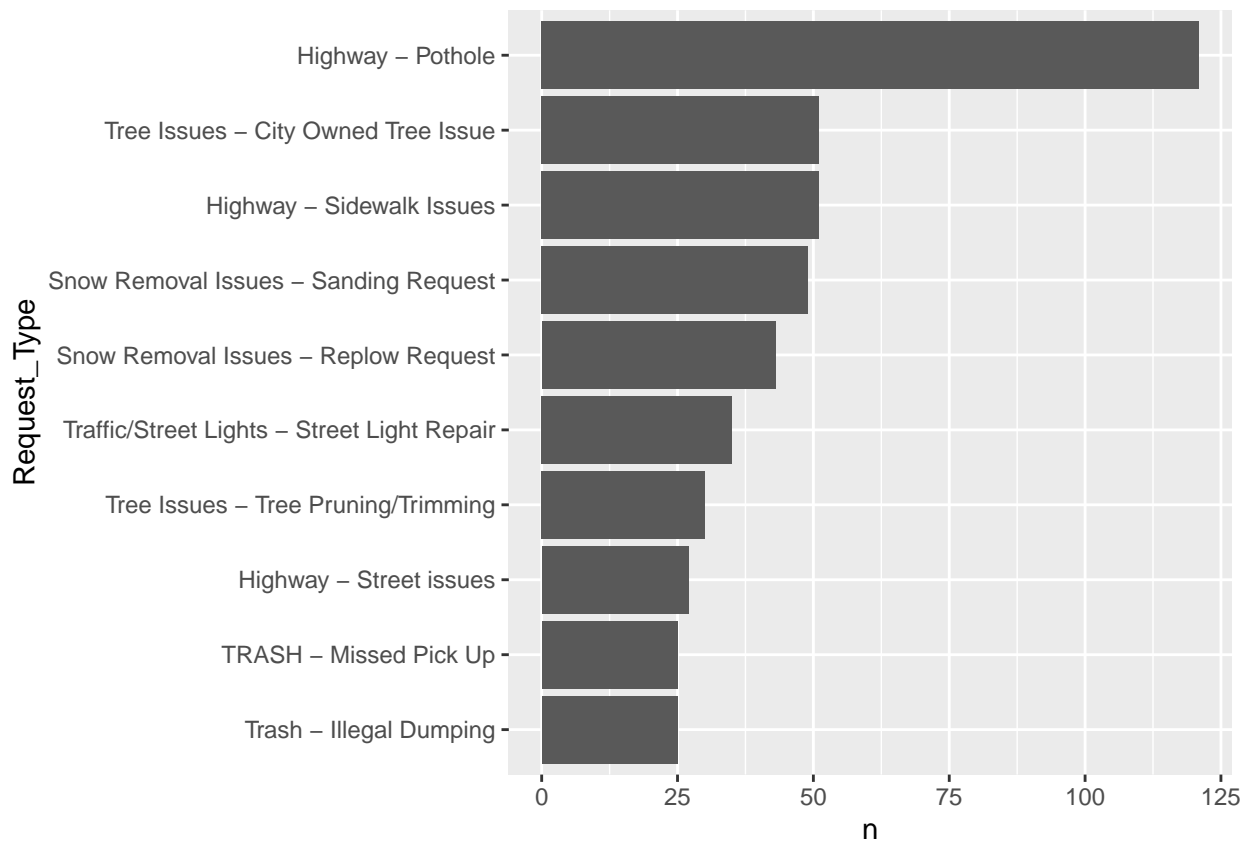
Haverhill Ward&Precinct 1-3 Request Type Frequency

```
## # A tibble: 88 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      176
## 2 Snow Removal Issues - Sanding Request    66
## 3 TRASH - Missed Pick Up    56
## 4 Snow Removal Issues - Replow Request    54
## 5 Traffic/Street Lights - Street Light Repair 38
## 6 Snow Removal Issues - Street Unplowed    37
## 7 Tree Issues - City Owned Tree Issue    35
## 8 Tree Issues - Tree Pruning/Trimming    32
## 9 Highway - Overgrown grass/weeds    25
## 10 Highway - Sidewalk Issues    25
## # ... with 78 more rows
```

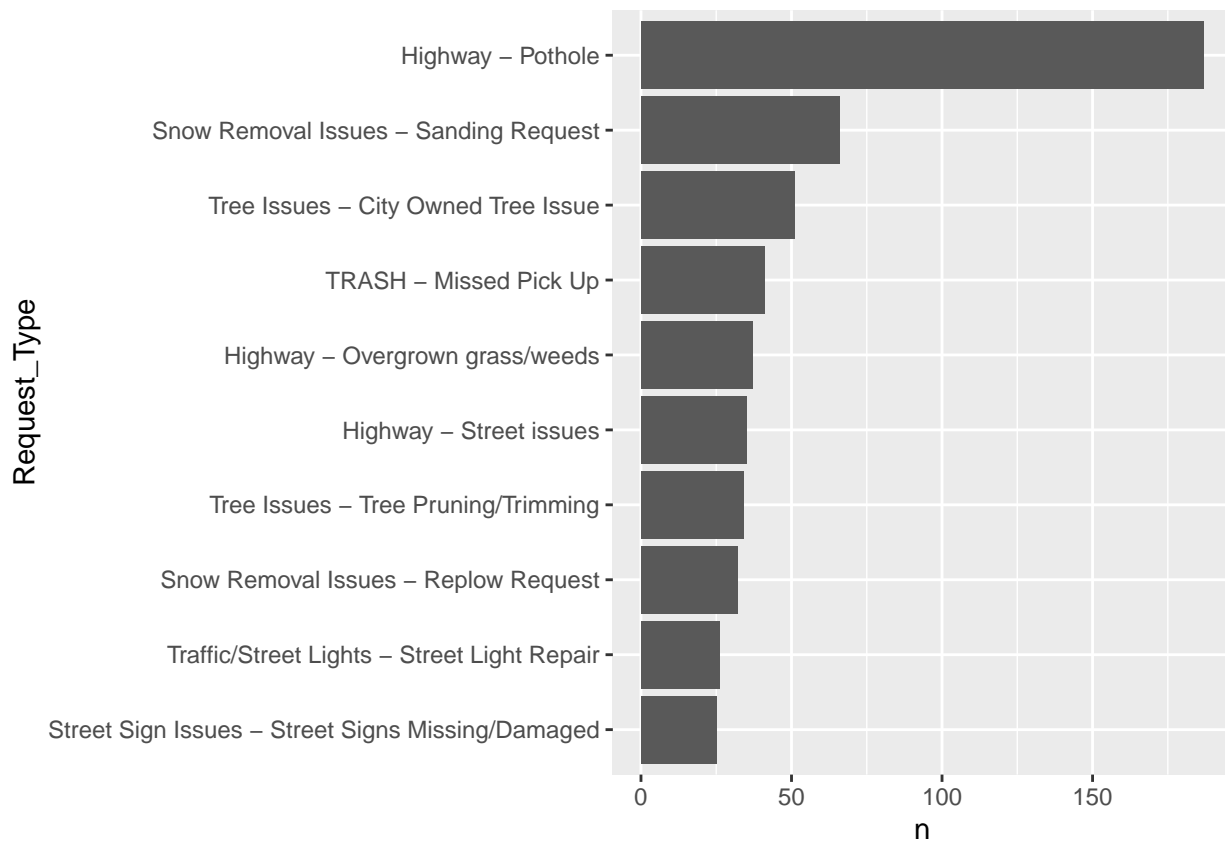
Haverhill Ward&Precinct 2-1 Request Type Frequency

```
## # A tibble: 95 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      121
## 2 Highway - Sidewalk Issues    51
## 3 Tree Issues - City Owned Tree Issue    51
## 4 Snow Removal Issues - Sanding Request    49
## 5 Snow Removal Issues - Replow Request    43
## 6 Traffic/Street Lights - Street Light Repair    35
## 7 Tree Issues - Tree Pruning/Trimming    30
## 8 Highway - Street issues    27
## 9 Trash - Illegal Dumping    25
## 10 TRASH - Missed Pick Up    25
## # ... with 85 more rows
```



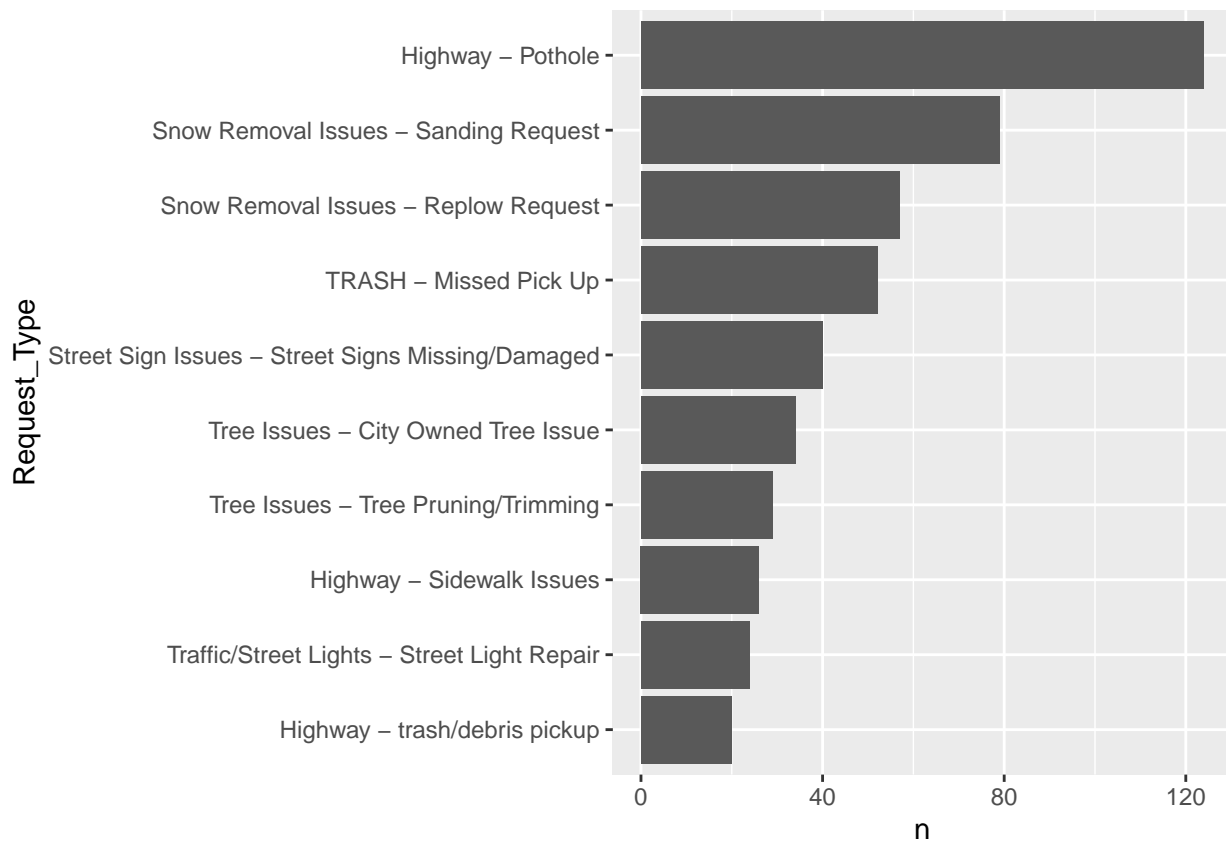
Haverhill Ward&Precinct 2-2 Request Type Frequency

```
## # A tibble: 93 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      117
## 2 Snow Removal Issues - Sanding Request    49
## 3 Tree Issues - City Owned Tree Issue     51
## 4 TRASH - Missed Pick Up    25
## 5 Highway - Overgrown grass/weeds        37
## 6 Highway - Street issues    27
## 7 Tree Issues - Tree Pruning/Trimming     30
## 8 Snow Removal Issues - Replow Request    44
## 9 Traffic/Street Lights - Street Light Repair 35
## 10 Street Sign Issues - Street Signs Missing/Damaged 25
## # ... with 83 more rows
```



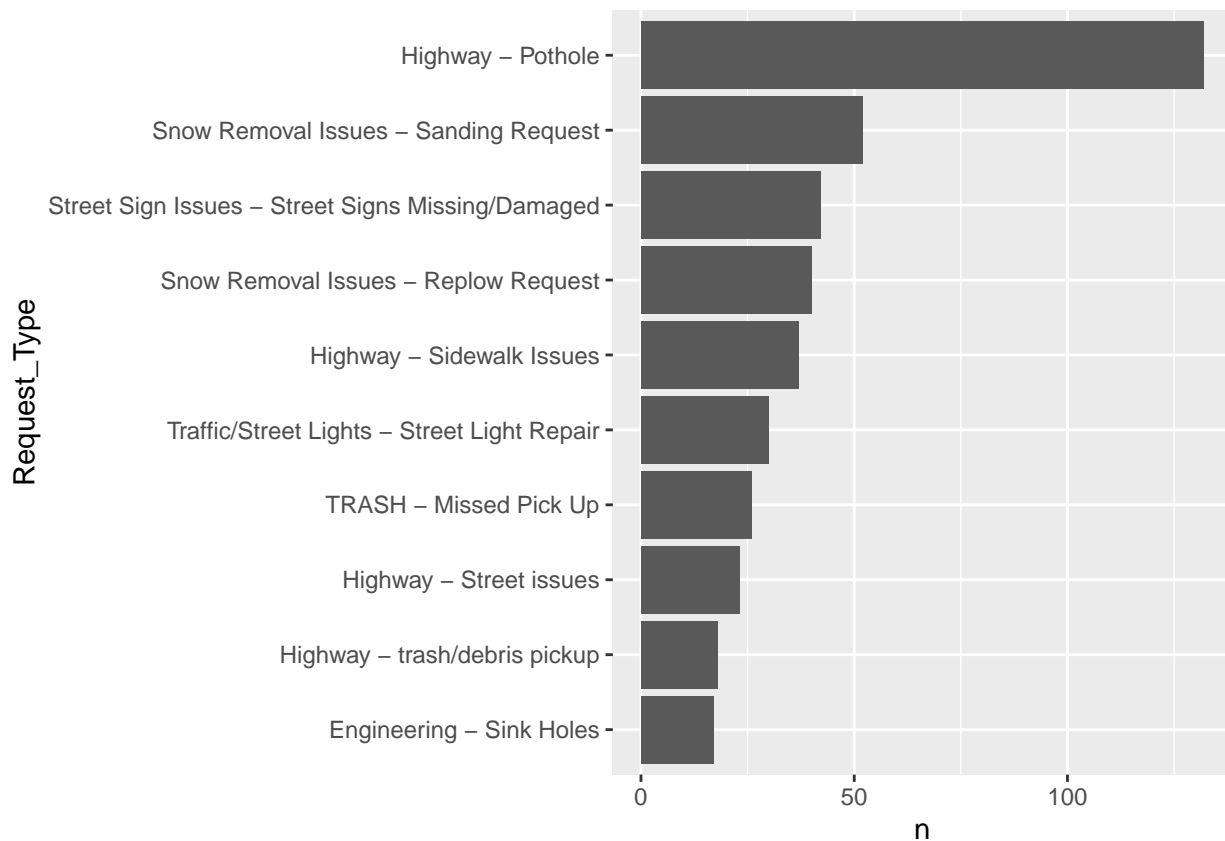
Haverhill Ward&Precinct 2-3 Request Type Frequency

```
## # A tibble: 95 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      124
## 2 Snow Removal Issues - Sanding Request      79
## 3 Snow Removal Issues - Replow Request       57
## 4 TRASH - Missed Pick Up      52
## 5 Street Sign Issues - Street Signs Missing/Damaged 40
## 6 Tree Issues - City Owned Tree Issue       34
## 7 Tree Issues - Tree Pruning/Trimming       29
## 8 Highway - Sidewalk Issues       26
## 9 Traffic/Street Lights - Street Light Repair  24
## 10 Highway - trash/debris pickup       20
## # ... with 85 more rows
```



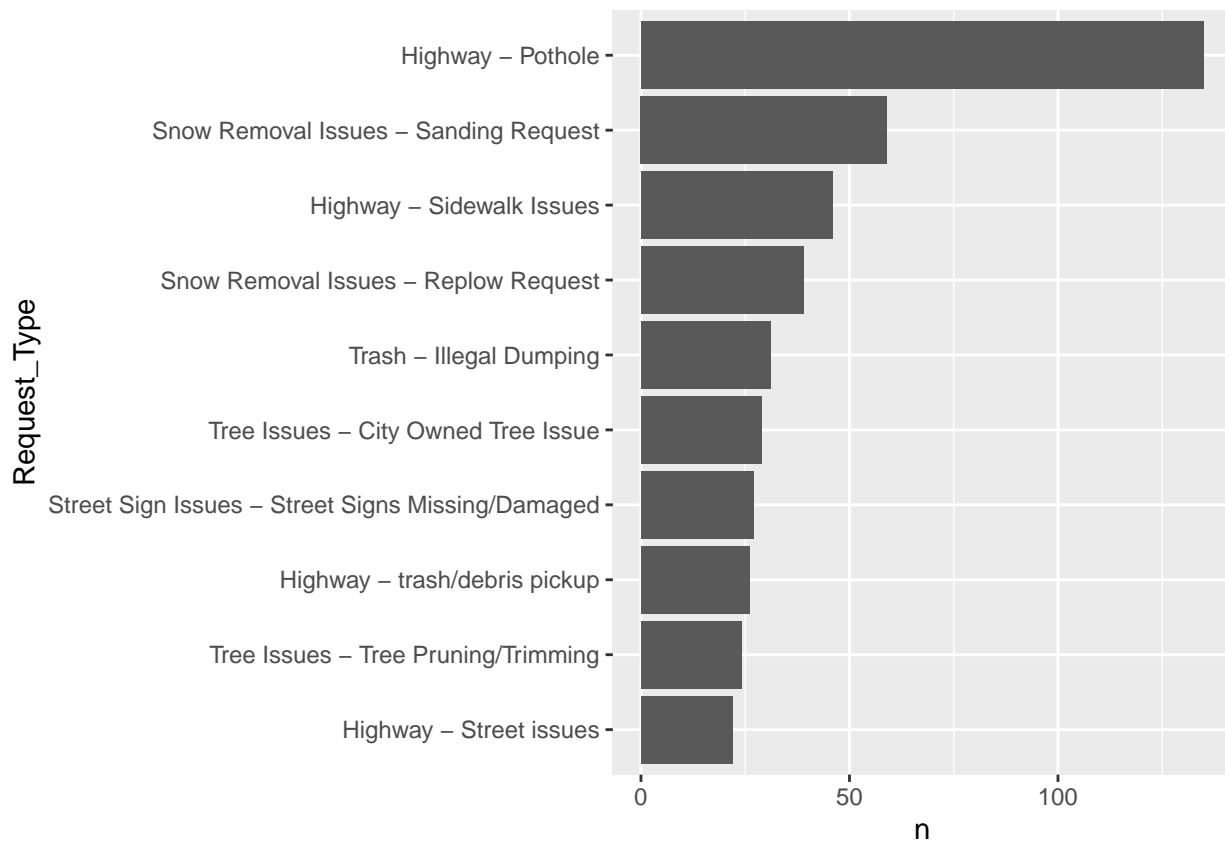
Haverhill Ward&Precinct 3-1 Request Type Frequency

```
## # A tibble: 90 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      132
## 2 Snow Removal Issues - Sanding Request      52
## 3 Street Sign Issues - Street Signs Missing/Damaged      42
## 4 Snow Removal Issues - Replow Request      40
## 5 Highway - Sidewalk Issues      37
## 6 Traffic/Street Lights - Street Light Repair      30
## 7 TRASH - Missed Pick Up      26
## 8 Highway - Street issues      23
## 9 Highway - trash/debris pickup      18
## 10 Engineering - Sink Holes      17
## # ... with 80 more rows
```



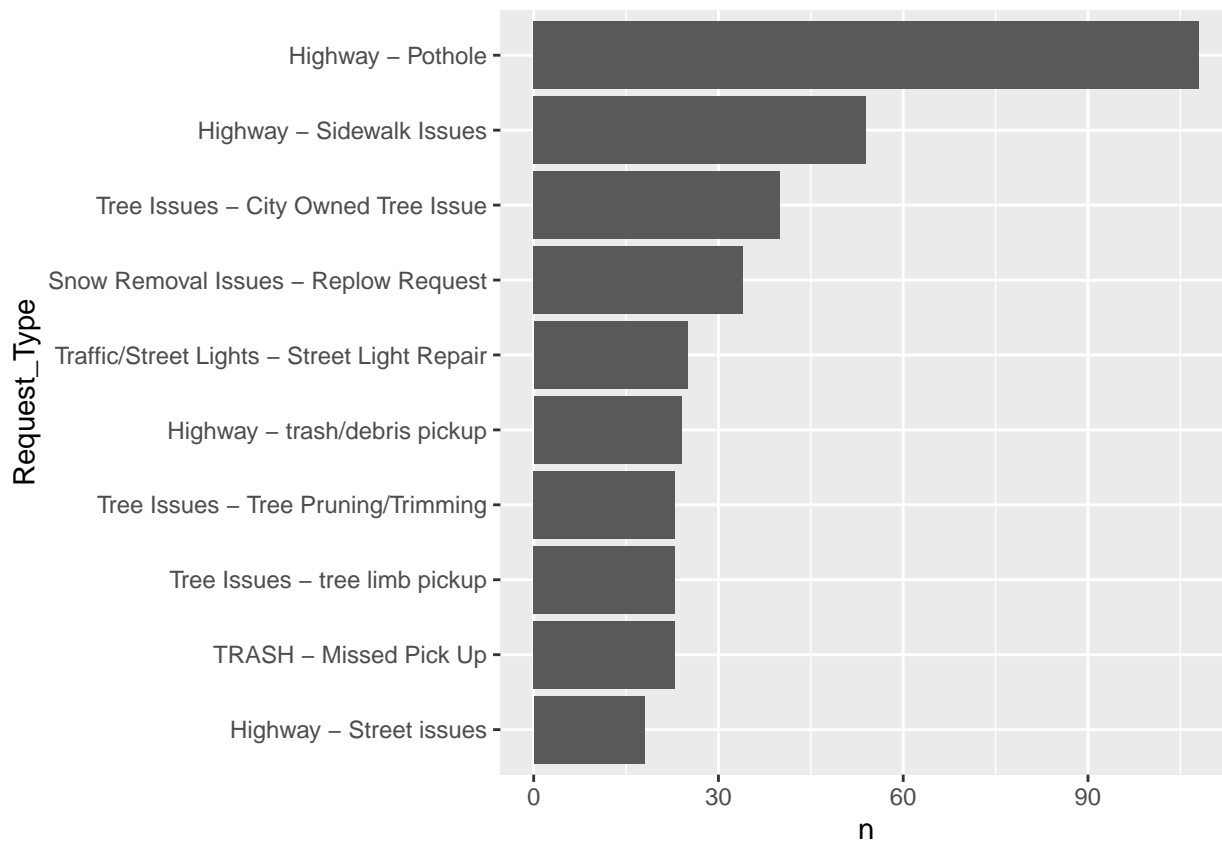
Haverhill Ward&Precinct 3-2 Request Type Frequency

```
## # A tibble: 98 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      135
## 2 Snow Removal Issues - Sanding Request      59
## 3 Highway - Sidewalk Issues      46
## 4 Snow Removal Issues - Replow Request      39
## 5 Trash - Illegal Dumping      31
## 6 Tree Issues - City Owned Tree Issue      29
## 7 Street Sign Issues - Street Signs Missing/Damaged      27
## 8 Highway - trash/debris pickup      26
## 9 Tree Issues - Tree Pruning/Trimming      24
## 10 Highway - Street issues      22
## # ... with 88 more rows
```



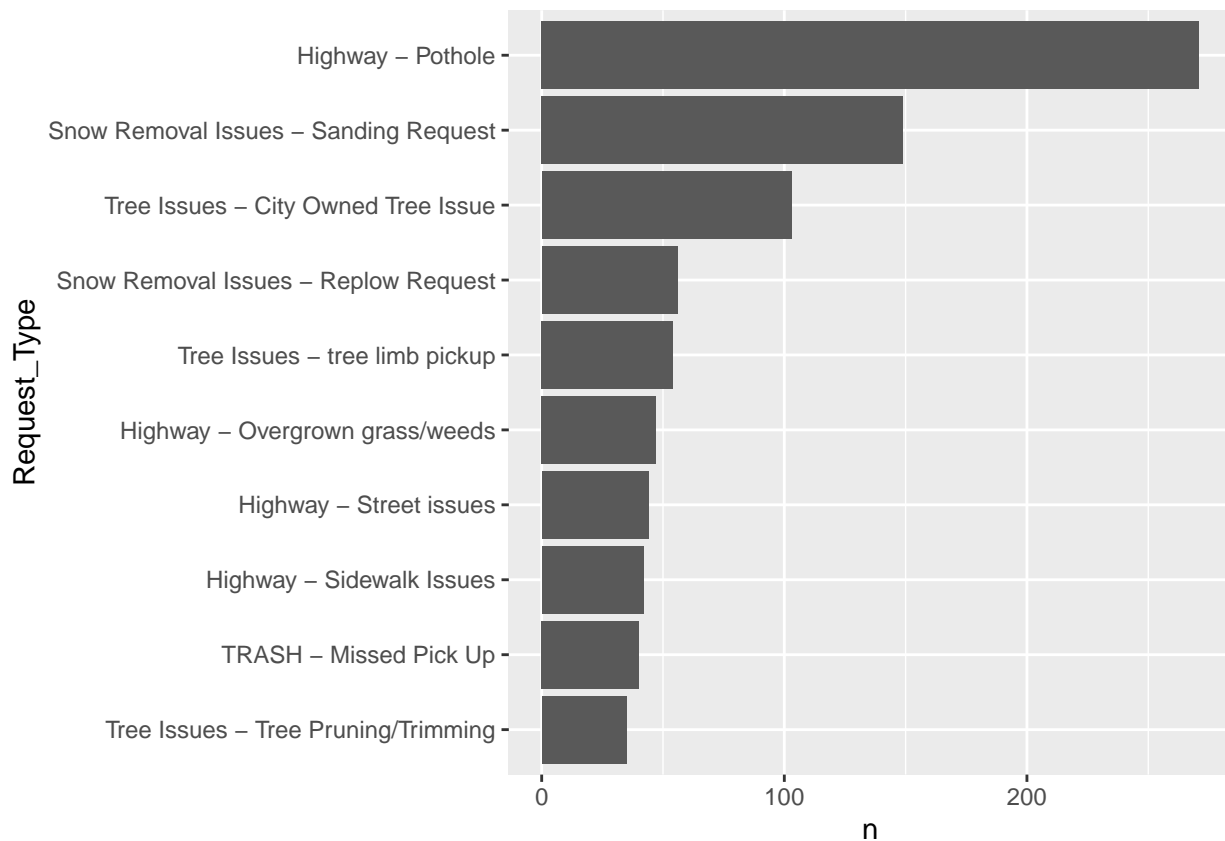
Haverhill Ward&Precinct 3-3 Request Type Frequency

```
## # A tibble: 93 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      108
## 2 Highway - Sidewalk Issues    54
## 3 Tree Issues - City Owned Tree Issue    40
## 4 Snow Removal Issues - Replow Request    34
## 5 Traffic/Street Lights - Street Light Repair    25
## 6 Highway - trash/debris pickup    24
## 7 TRASH - Missed Pick Up    23
## 8 Tree Issues - tree limb pickup    23
## 9 Tree Issues - Tree Pruning/Trimming    23
## 10 Highway - Street issues    18
## # ... with 83 more rows
```



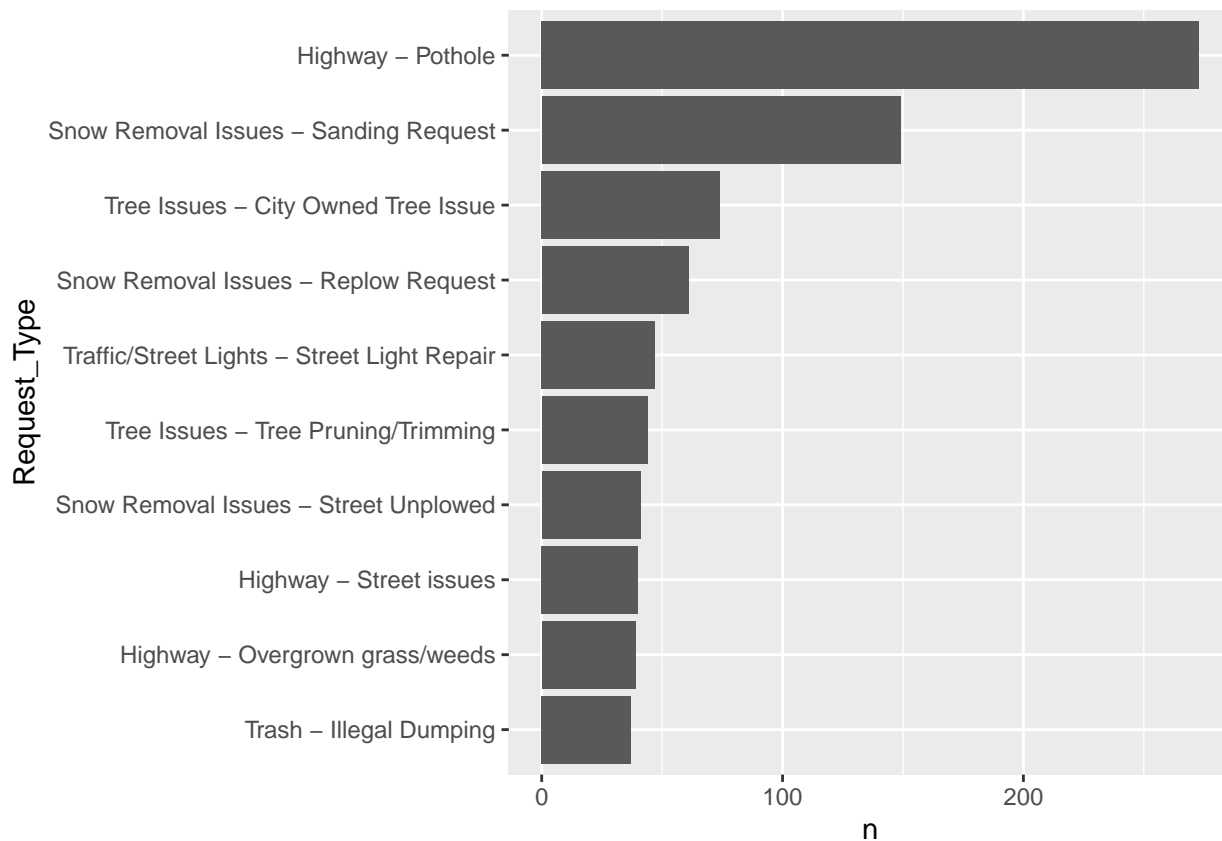
Haverhill Ward&Precinct 4-1 Request Type Frequency

```
## # A tibble: 99 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      271
## 2 Snow Removal Issues - Sanding Request  149
## 3 Tree Issues - City Owned Tree Issue    103
## 4 Snow Removal Issues - Replow Request    56
## 5 Tree Issues - tree limb pickup          54
## 6 Highway - Overgrown grass/weeds         47
## 7 Highway - Street issues                 44
## 8 Highway - Sidewalk Issues               42
## 9 TRASH - Missed Pick Up                  40
## 10 Tree Issues - Tree Pruning/Trimming     35
## # ... with 89 more rows
```



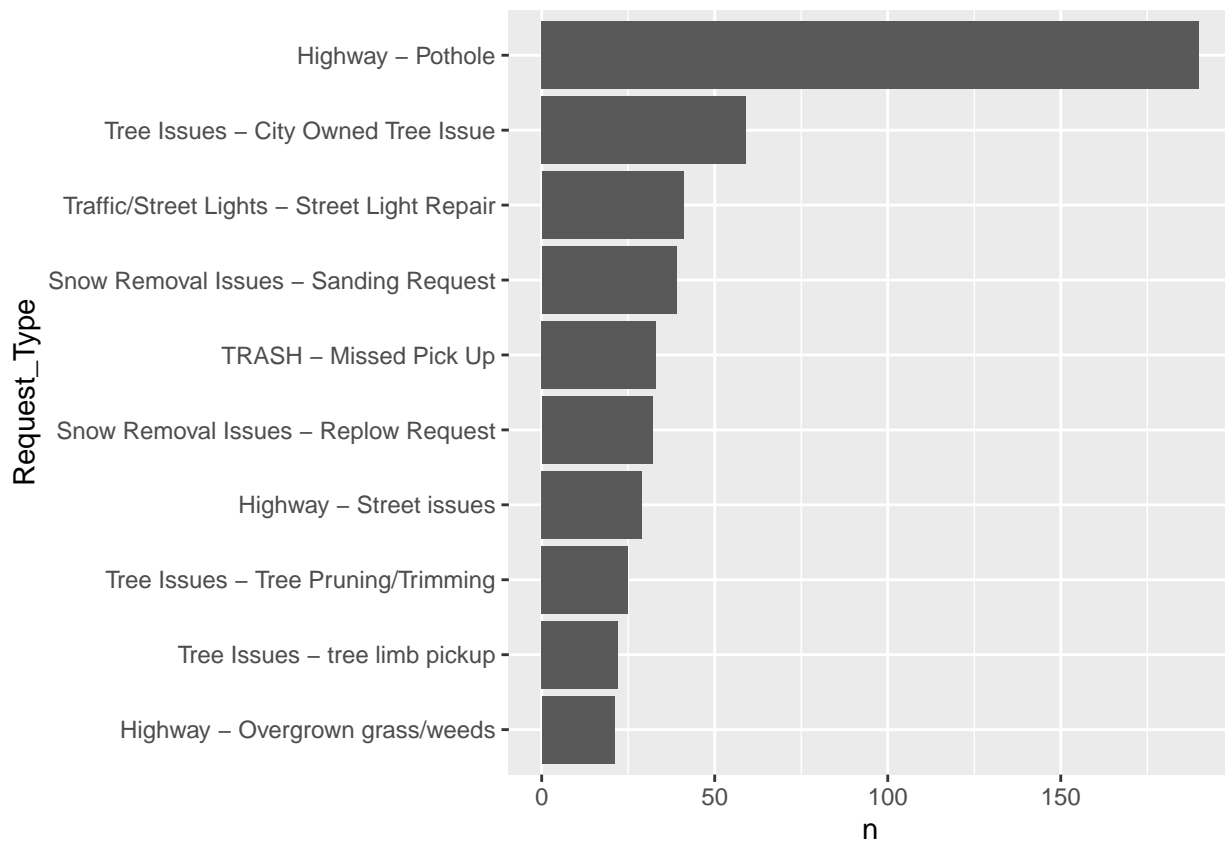
Haverhill Ward&Precinct 4-2 Request Type Frequency

```
## # A tibble: 97 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      273
## 2 Snow Removal Issues - Sanding Request    149
## 3 Tree Issues - City Owned Tree Issue      74
## 4 Snow Removal Issues - Replow Request     61
## 5 Traffic/Street Lights - Street Light Repair 47
## 6 Tree Issues - Tree Pruning/Trimming      44
## 7 Snow Removal Issues - Street Unplowed     41
## 8 Highway - Street issues      40
## 9 Highway - Overgrown grass/weeds          39
## 10 Trash - Illegal Dumping              37
## # ... with 87 more rows
```

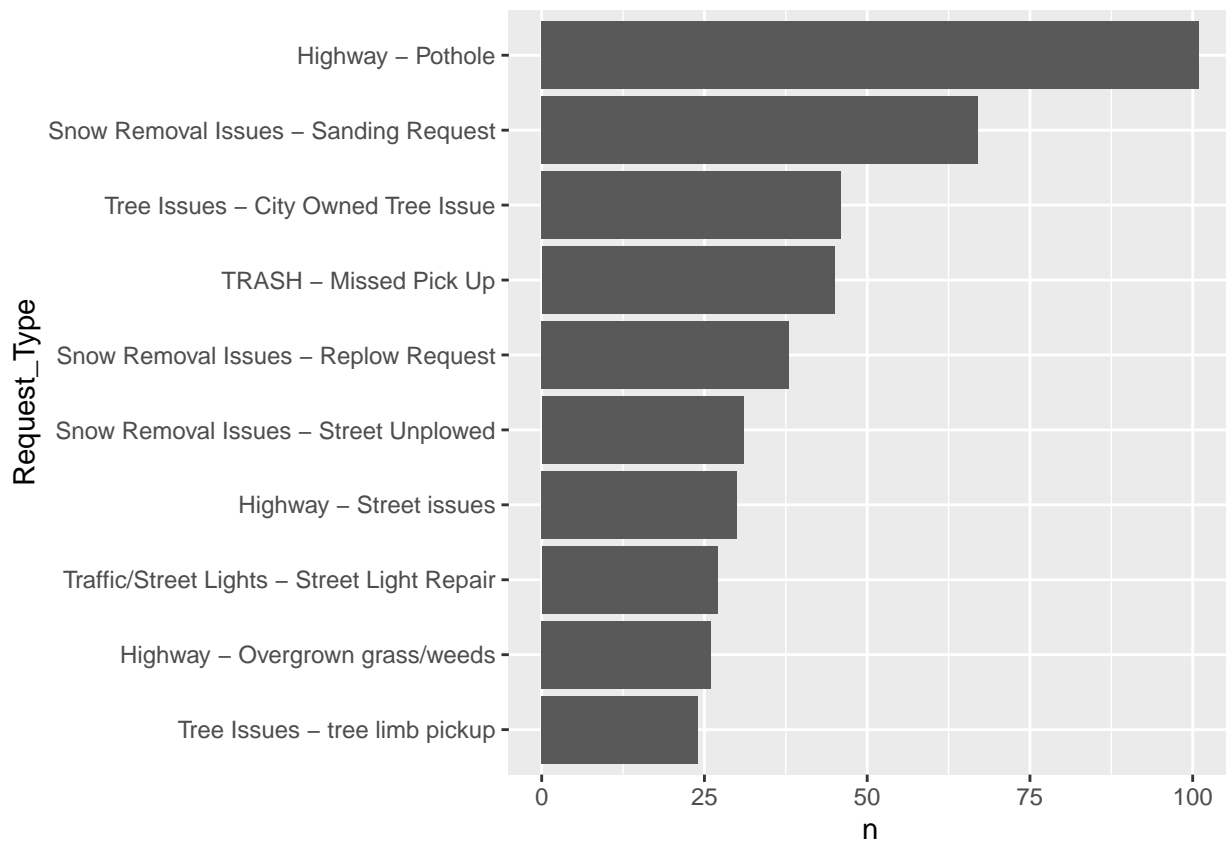
Haverhill Ward&Precinct 4-3 Request Type Frequency

```
## # A tibble: 90 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      190
## 2 Tree Issues - City Owned Tree Issue      59
## 3 Traffic/Street Lights - Street Light Repair      41
## 4 Snow Removal Issues - Sanding Request      39
## 5 TRASH - Missed Pick Up      33
## 6 Snow Removal Issues - Replow Request      32
## 7 Highway - Street issues      29
## 8 Tree Issues - Tree Pruning/Trimming      25
## 9 Tree Issues - tree limb pickup      22
## 10 Highway - Overgrown grass/weeds      21
## # ... with 80 more rows
```



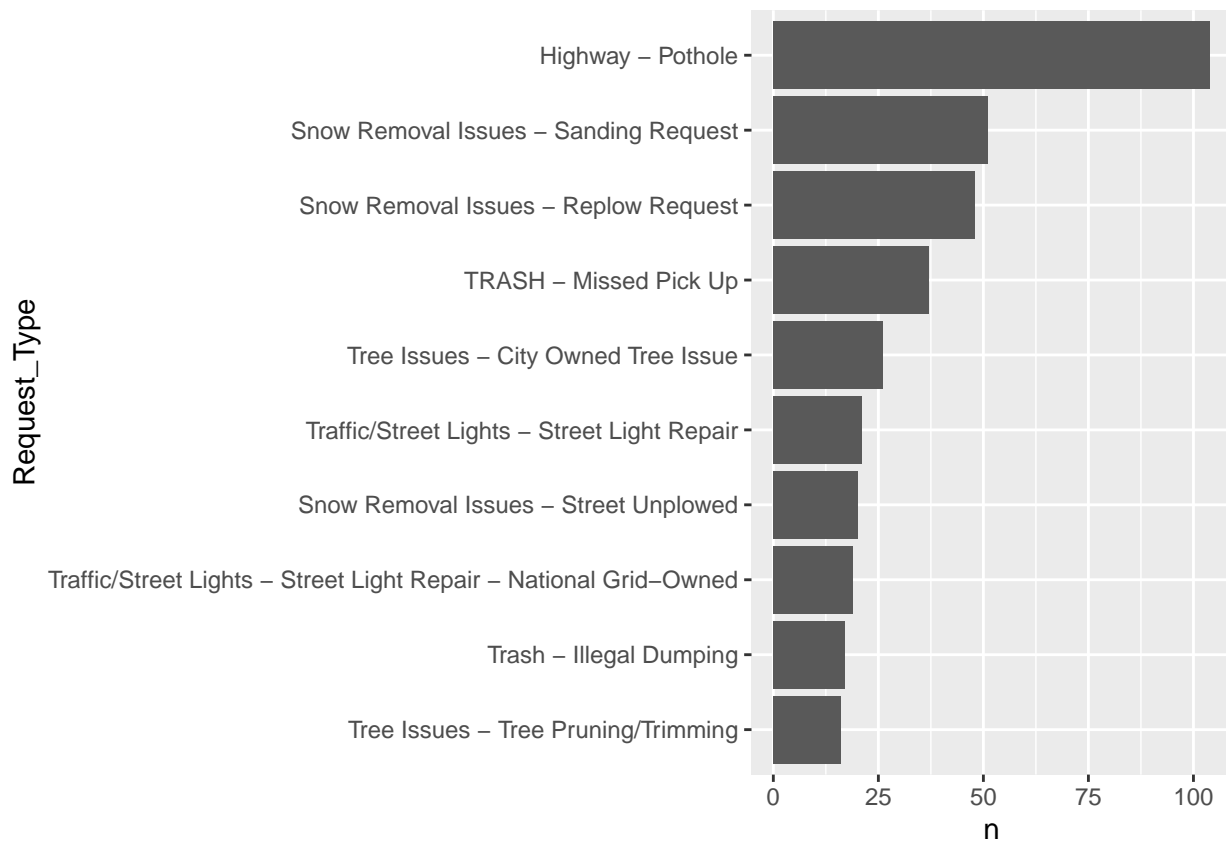
Haverhill Ward&Precinct 5-1 Request Type Frequency

```
## # A tibble: 92 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      101
## 2 Snow Removal Issues - Sanding Request      67
## 3 Tree Issues - City Owned Tree Issue       46
## 4 TRASH - Missed Pick Up       45
## 5 Snow Removal Issues - Replow Request       38
## 6 Snow Removal Issues - Street Unplowed       31
## 7 Highway - Street issues       30
## 8 Traffic/Street Lights - Street Light Repair  27
## 9 Highway - Overgrown grass/weeds       26
## 10 Tree Issues - tree limb pickup       24
## # ... with 82 more rows
```



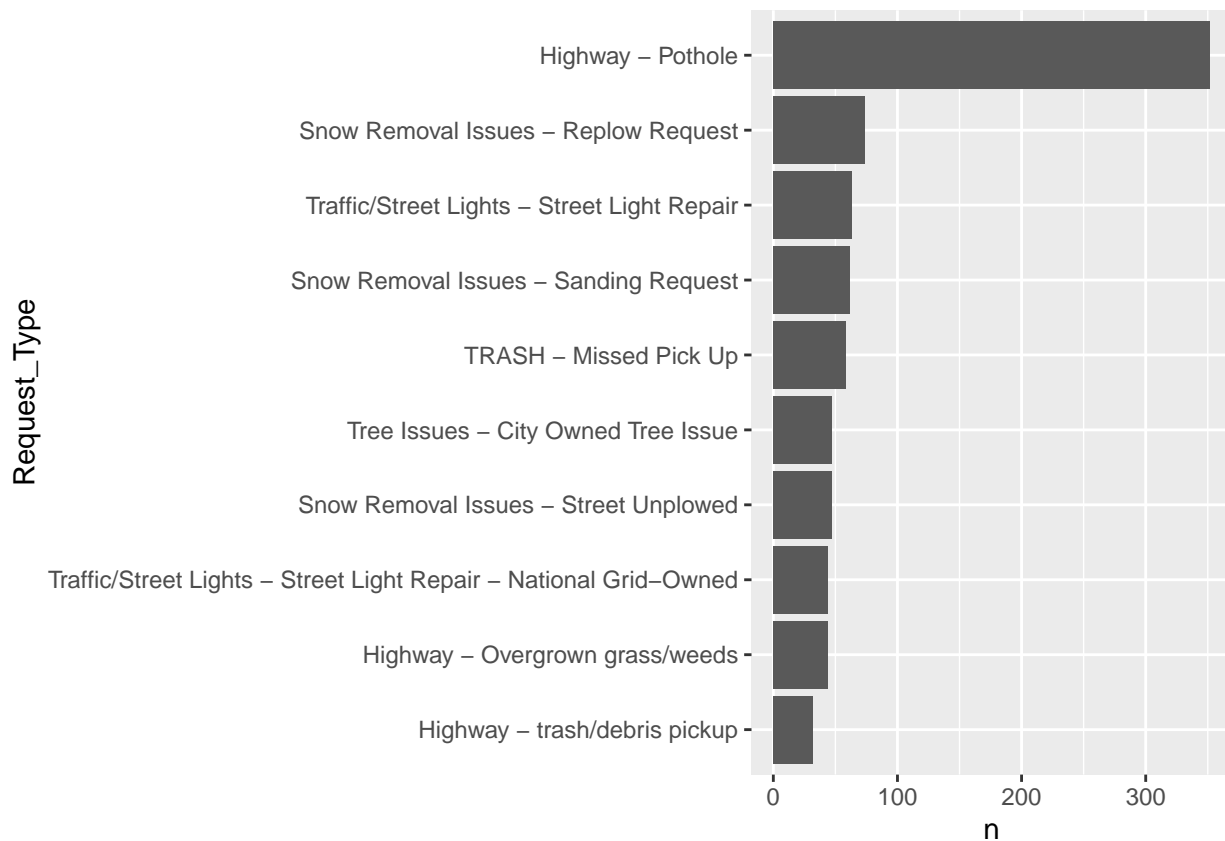
Haverhill Ward&Precinct 5-2 Request Type Frequency

```
## # A tibble: 81 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      104
## 2 Snow Removal Issues - Sanding Request      51
## 3 Snow Removal Issues - Replow Request      48
## 4 TRASH - Missed Pick Up      37
## 5 Tree Issues - City Owned Tree Issue      26
## 6 Traffic/Street Lights - Street Light Repair      21
## 7 Snow Removal Issues - Street Unplowed      20
## 8 Traffic/Street Lights - Street Light Repair - National Grid-Owned      19
## 9 Trash - Illegal Dumping      17
## 10 Tree Issues - Tree Pruning/Trimming      16
## # ... with 71 more rows
```



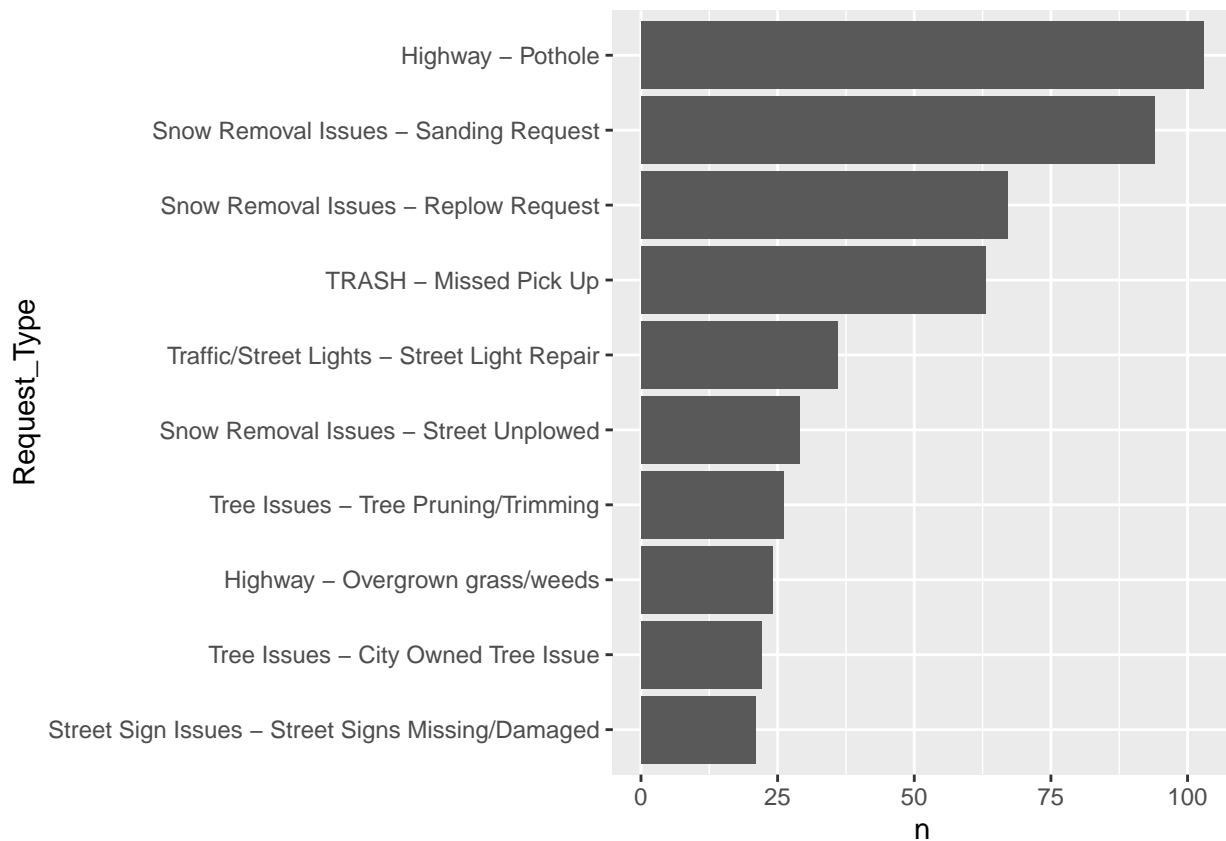
Haverhill Ward&Precinct 5-3 Request Type Frequency

```
## # A tibble: 98 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      352
## 2 Snow Removal Issues - Replow Request      74
## 3 Traffic/Street Lights - Street Light Repair      63
## 4 Snow Removal Issues - Sanding Request      62
## 5 TRASH - Missed Pick Up      58
## 6 Snow Removal Issues - Street Unplowed      47
## 7 Tree Issues - City Owned Tree Issue      47
## 8 Highway - Overgrown grass/weeds      44
## 9 Traffic/Street Lights - Street Light Repair - National Grid-Owned      44
## 10 Highway - trash/debris pickup      32
## # ... with 88 more rows
```



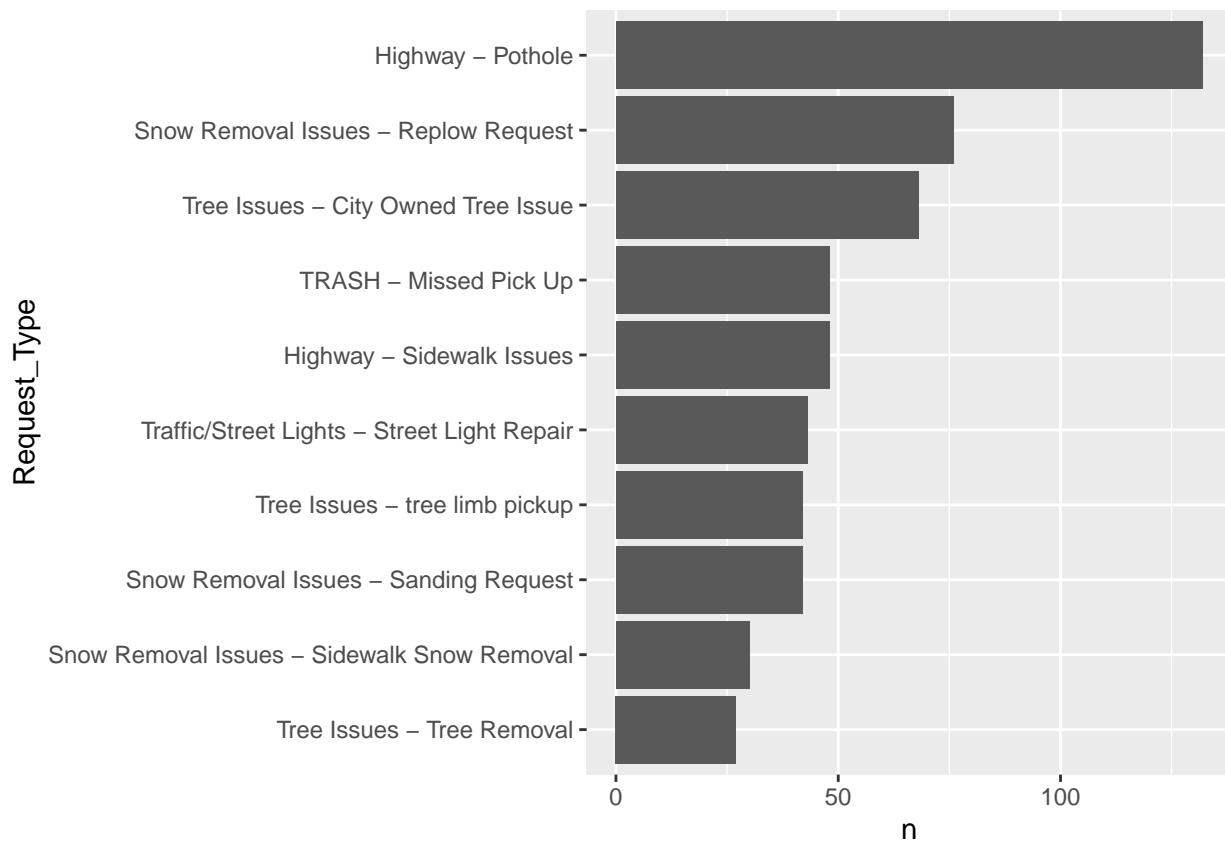
Haverhill Ward&Precinct 6-1 Request Type Frequency

```
## # A tibble: 92 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      103
## 2 Snow Removal Issues - Sanding Request      94
## 3 Snow Removal Issues - Replow Request       67
## 4 TRASH - Missed Pick Up       63
## 5 Traffic/Street Lights - Street Light Repair   36
## 6 Snow Removal Issues - Street Unplowed       29
## 7 Tree Issues - Tree Pruning/Trimming       26
## 8 Highway - Overgrown grass/weeds            24
## 9 Tree Issues - City Owned Tree Issue        22
## 10 Street Sign Issues - Street Signs Missing/Damaged 21
## # ... with 82 more rows
```



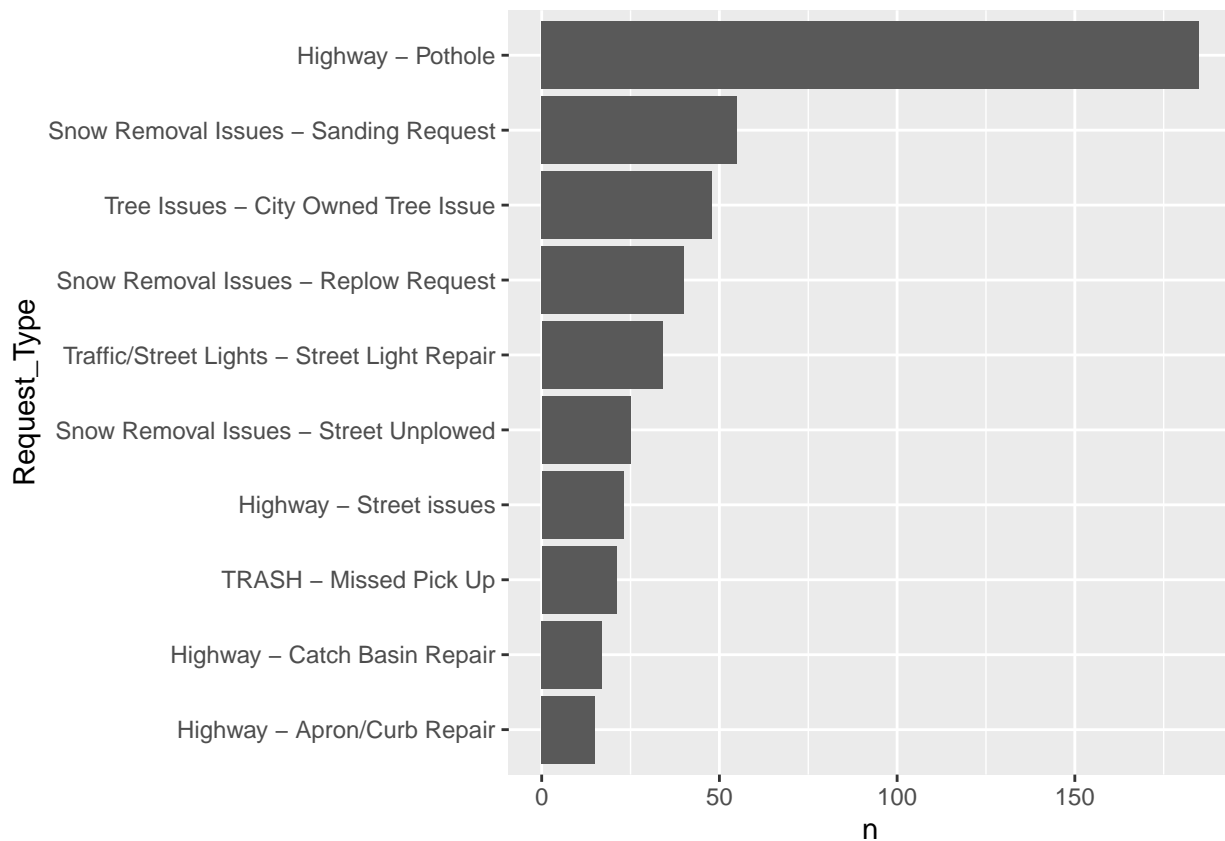
Haverhill Ward&Precinct 6-2 Request Type Frequency

```
## # A tibble: 101 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      132
## 2 Snow Removal Issues - Replow Request      76
## 3 Tree Issues - City Owned Tree Issue      68
## 4 Highway - Sidewalk Issues      48
## 5 TRASH - Missed Pick Up      48
## 6 Traffic/Street Lights - Street Light Repair 43
## 7 Snow Removal Issues - Sanding Request      42
## 8 Tree Issues - tree limb pickup      42
## 9 Snow Removal Issues - Sidewalk Snow Removal 30
## 10 Tree Issues - Tree Removal      27
## # ... with 91 more rows
```



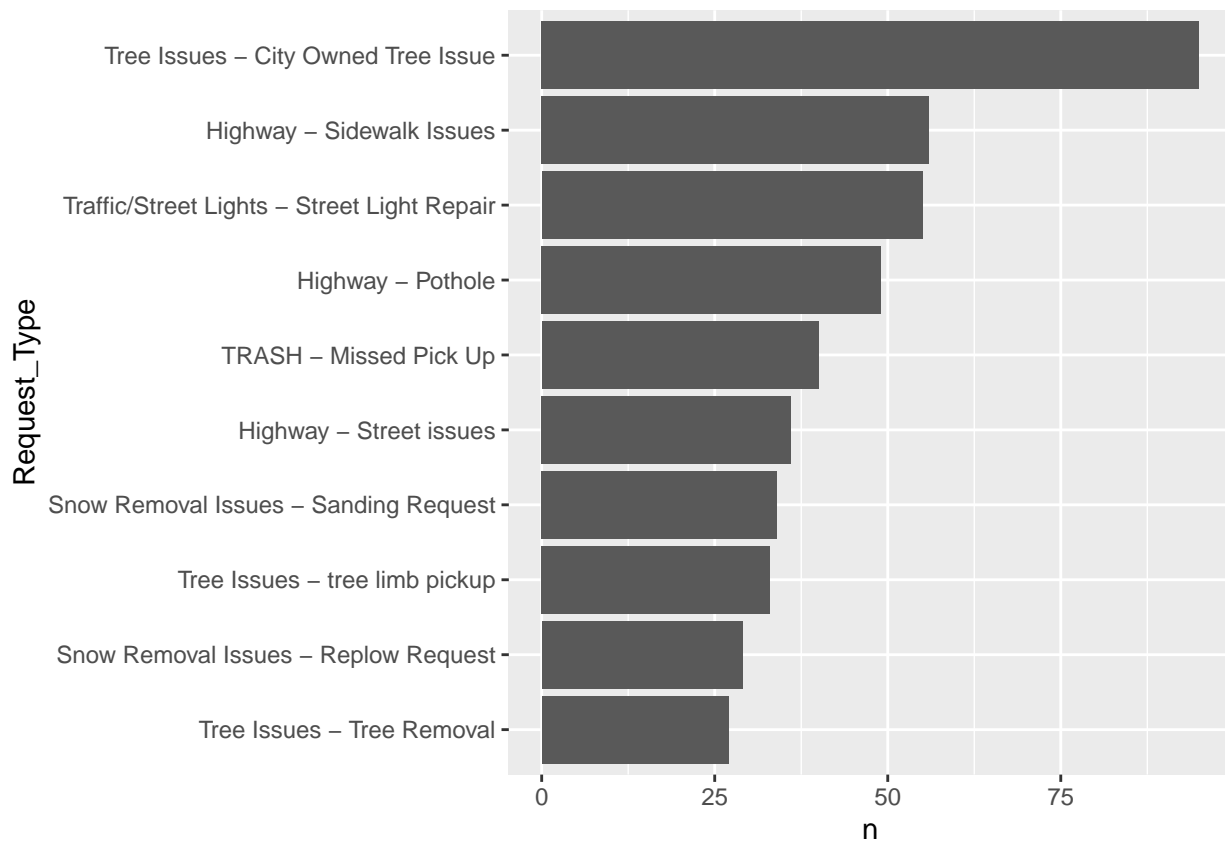
Haverhill Ward&Precinct 6-3 Request Type Frequency

```
## # A tibble: 77 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      185
## 2 Snow Removal Issues - Sanding Request    55
## 3 Tree Issues - City Owned Tree Issue     48
## 4 Snow Removal Issues - Replow Request     40
## 5 Traffic/Street Lights - Street Light Repair 34
## 6 Snow Removal Issues - Street Unplowed    25
## 7 Highway - Street issues      23
## 8 TRASH - Missed Pick Up      21
## 9 Highway - Catch Basin Repair    17
## 10 Highway - Apron/Curb Repair    15
## # ... with 67 more rows
```



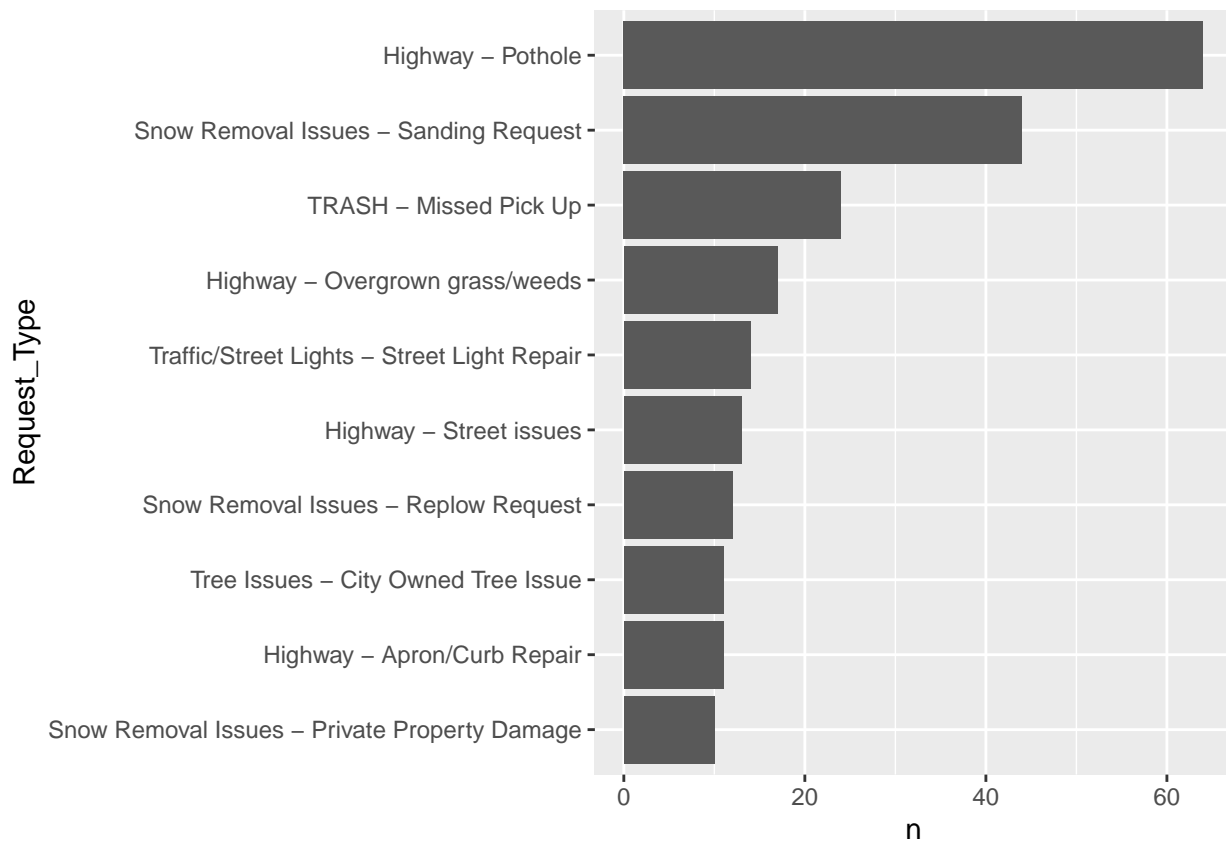
Haverhill Ward&Precinct 7-1 Request Type Frequency

```
## # A tibble: 92 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Tree Issues - City Owned Tree Issue      95
## 2 Highway - Sidewalk Issues                 56
## 3 Traffic/Street Lights - Street Light Repair 55
## 4 Highway - Pothole                        49
## 5 TRASH - Missed Pick Up                   40
## 6 Highway - Street issues                   36
## 7 Snow Removal Issues - Sanding Request     34
## 8 Tree Issues - tree limb pickup            33
## 9 Snow Removal Issues - Replow Request      29
## 10 Tree Issues - Tree Removal                27
## # ... with 82 more rows
```

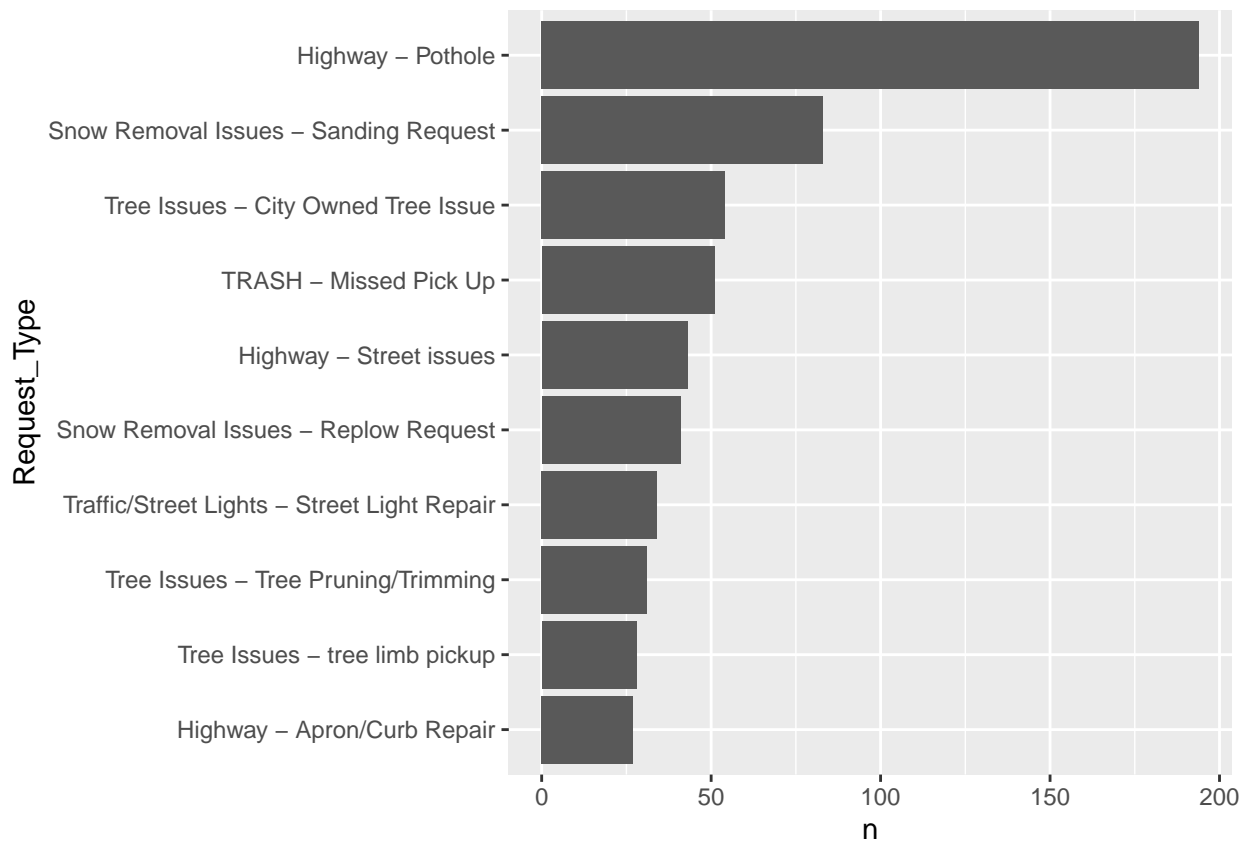
Haverhill Ward&Precinct 7-2 Request Type Frequency

```
## # A tibble: 68 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      64
## 2 Snow Removal Issues - Sanding Request 44
## 3 TRASH - Missed Pick Up 24
## 4 Highway - Overgrown grass/weeds      17
## 5 Traffic/Street Lights - Street Light Repair 14
## 6 Highway - Street issues      13
## 7 Snow Removal Issues - Replow Request 12
## 8 Highway - Apron/Curb Repair      11
## 9 Tree Issues - City Owned Tree Issue 11
## 10 Snow Removal Issues - Private Property Damage 10
## # ... with 58 more rows
```



Haverhill Ward&Precinct 7-3 Request Type Frequency

```
## # A tibble: 90 x 2
##   Request_Type      n
##   <chr>          <int>
## 1 Highway - Pothole      194
## 2 Snow Removal Issues - Sanding Request      83
## 3 Tree Issues - City Owned Tree Issue       54
## 4 TRASH - Missed Pick Up       51
## 5 Highway - Street issues       43
## 6 Snow Removal Issues - Replow Request       41
## 7 Traffic/Street Lights - Street Light Repair  34
## 8 Tree Issues - Tree Pruning/Trimming       31
## 9 Tree Issues - tree limb pickup           28
## 10 Highway - Apron/Curb Repair              27
## # ... with 80 more rows
```



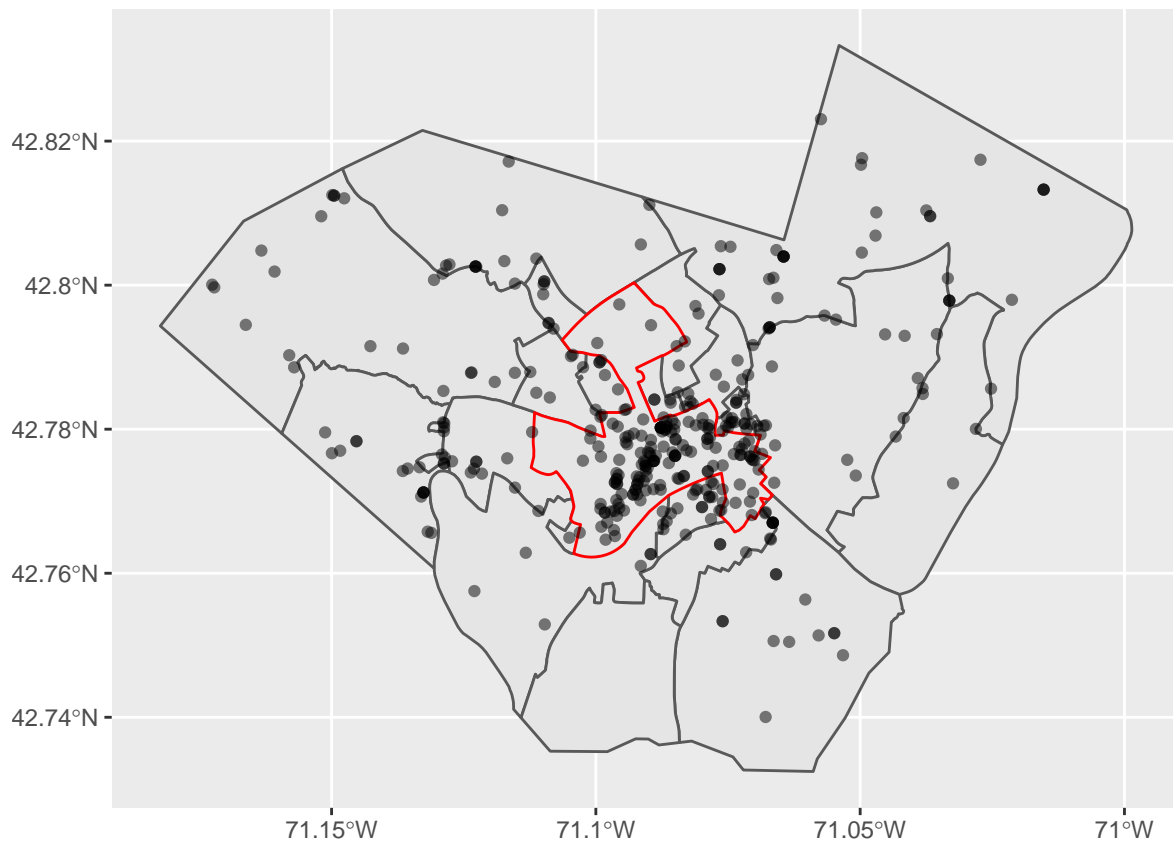
Top 10 Location Requesting Services

```
## # A tibble: 10 x 2
##   Address      n
##   <chr>    <int>
## 1 MAIN ST    174
## 2 WASHINGTON ST 112
## 3 BROADWAY    97
## 4 KENOZA AVE   80
## 5 HILLDALE AVE 76
## 6 RIVER ST    71
## 7 WATER ST    68
## 8 MILL ST     66
## 9 NORTH AVE   64
## 10 KENOZA ST   62
```

Illegal Dumping Sites

```
## # A tibble: 16 x 2
##   Address      n
##   <chr>    <int>
## 1 LANCASTER ST    7
## 2 RIVER ST        6
## 3 KENOZA ST       5
## 4 VALE ST         5
```

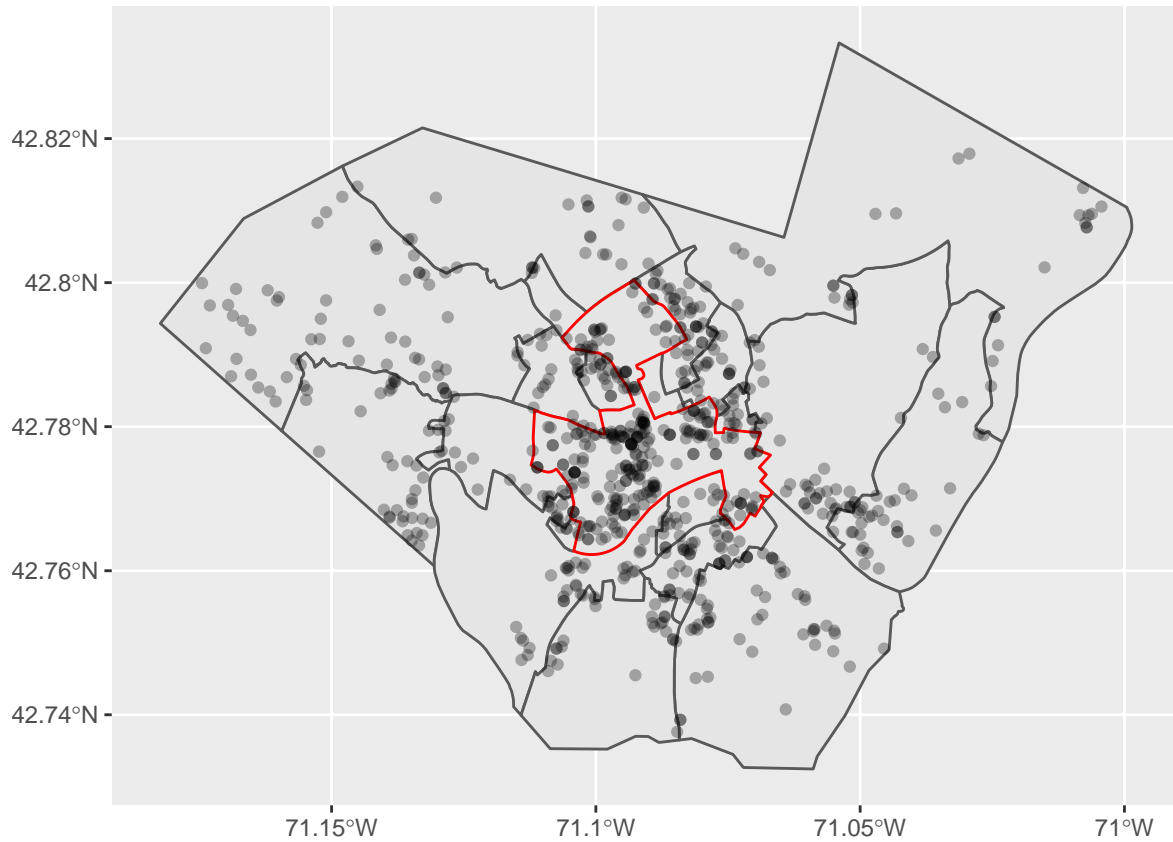
```
## 5 1318 RIVER ST      4
## 6 HIGH ST           4
## 7 PEABODY ST        4
## 8 164 CROSBY ST EXT 3
## 9 29 MIDDLESEX ST   3
## 10 39 DUTTON RD      3
## 11 AMESBURY LINE RD 3
## 12 ARCH ST          3
## 13 JERICO RD        3
## 14 KENOZA AVE       3
## 15 MIDDLE RD        3
## 16 PILLING ST       3
```



Trash Missed Pickups

```
## # A tibble: 16 x 2
##   Address      n
##   <chr>    <int>
## 1 101 BLAISDELL ST      5
## 2 134 WARRENTON RD      5
## 3 28 BROADWAY          4
## 4 37 WELLINGTON AVE     4
## 5 643 WASHINGTON ST      4
## 6 12 VARNUM ST          3
## 7 123 COGSWELL ST       3
## 8 257 LOWELL AVE        3
```

```
## 9 32 WOODLAWN AVE      3
## 10 39 SOUTH CENTRAL ST 3
## 11 395 KINGSBURY AVE   3
## 12 60 CEDAR ST         3
## 13 672 BROADWAY        3
## 14 68-70 BROADWAY      3
## 15 73 HILLDALE AVE     3
## 16 78 LAWRENCE ST      3
```



Recycling Missed Pickups

```
## # A tibble: 11 x 2
##   Address      n
##   <chr>    <int>
## 1 12 CALEDONIA ST      2
## 2 17 TEMPLE ST        2
## 3 207 KENOZA ST       2
## 4 25 SALTONSTALL RD   2
## 5 3 E Broadway       2
## 6 35 IRIS WAY         2
## 7 421 MAIN ST        2
## 8 61 8TH AVE          2
## 9 650 EAST BROADWAY   2
## 10 77 BLOSSOM ST      2
## 11 772 HILLDALE AVE   2
```

