District Department of Transportation
Service Requests and Work Orders

Data Warehousing / OLAP for Analytics
Group Project | December 2015

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DDOT, Cityworks and DC Open Data

- The District Department of Transportation (**DDOT**) is a DC agency that **manages** and **maintains** publicly owned t**ransportation infrastructure**.

- **Cityworks** is the name of their **service request** and work order **management system**.

- Requests sent to the DDOT tend to involve maintenance of alleys, curbs, gutters, roadways, sidewalks, streetlights, among others.

- The **DC Open Data** website (*http://opendata.dc.gov*) stores o**pen datasets** related to multiple public services and agencies, including data on DDOT's service requests.

For more information on DDOT, please visit their website (http://ddot.dc.gov/)

The Dataset

http://opendata.dc.gov/datasets/8311590ecf2c4de294c1556c48c2837c_1

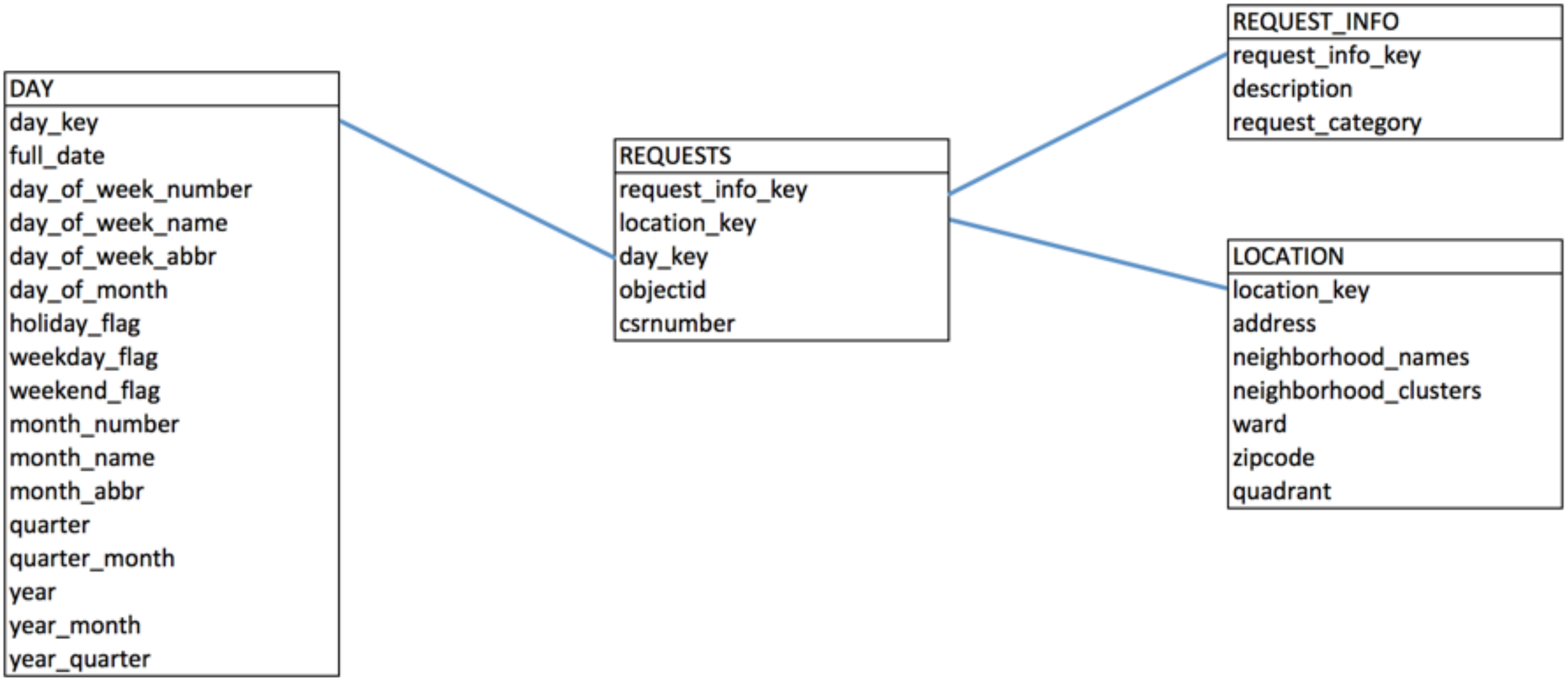
- **Transactional dataset** storing around **6 years** of work order and service requests sent to DDOT.
- How big? **276 MB**
- How many records? Over **640,000** requests (new requests are added periodically every week)
- How many columns? **52**, including:

1: X
2: Y
3: OBJECTID
4: REQUESTID
5: WORKORDERID
6: CSRNUMBER
7: DESCRIPTION
8: STATUS
9: REQUESTCATEGORY
10: INITIATEDDATE
11: CLOSEDDATE
12: INSPECTIONDATE
13: INSPECTIONCOMPLETE
14: SUBMITTEDTODATE
15: DISPATCHEDTODATE
16: CANCELEDDATE
17: PRIORITY
18: INITIATEDBY
19: SUBMITTEDTO
20: DISPATCHEDTO
21: CLOSEDBY
22: PROJECTNAME
23: ISCANCELED
24: CANCELEDBY
25: ADDRESS
26: FISCALYEAR
27: WARD
28: QUADRANT
29: ZIPCODE
30: ANC
31: SMD
32: NEIGHBORHOODCLUSTERS
33: NEIGHBORHOODNAMES
34: BID
35: AWI
36: EDZ
37: NIF
38: HISTORICDISTRICT
39: ZONING
40: PUD
41: CFAR
42: PSA
43: PD
44: DAYSTOCLOSE
45: DAYSTOINSPECT
46: UPDATEDATE
47: XCOORD
48: YCOORD
49: ONSEGX
50: ONSEGY
51: LONGITUDE
52: LATITUDE

Transactional Schema

```
%%sql
CREATE TABLE ddot1 (
OBJECTID                    CHAR(10),
REQUESTID                   CHAR(10),
WORKORDERID                 CHAR(15),
CSRNUMBER                   VARCHAR(20),
DESCRIPTION                 VARCHAR(100),
STATUS                      CHAR(15),
REQUESTCATEGORY             VARCHAR(100),
INITIATEDDATE               DATETIME,
CLOSEDDATE                  DATETIME,
INSPECTIONDATE              DATETIME,
INSPECTIONCOMPLETE          VARCHAR(15),
PRIORITY                    VARCHAR(10),
ADDRESS                     VARCHAR(100),
FISCALYEAR                  CHAR(4),
WARD                        CHAR(4),
QUADRANT                    CHAR(4),
ZIPCODE                     CHAR(5),
NEIGHBORHOODCLUSTERS        VARCHAR(100),
NEIGHBORHOODNAMES           VARCHAR(100)
)
```

Designing our Data Warehouse



- 1 fact table (Requests)
- 3 dimensions (Day, Request_Info, Location)

Extract, Transform, Load

- First we populated our dimension tables. This part was easy following the class examples.

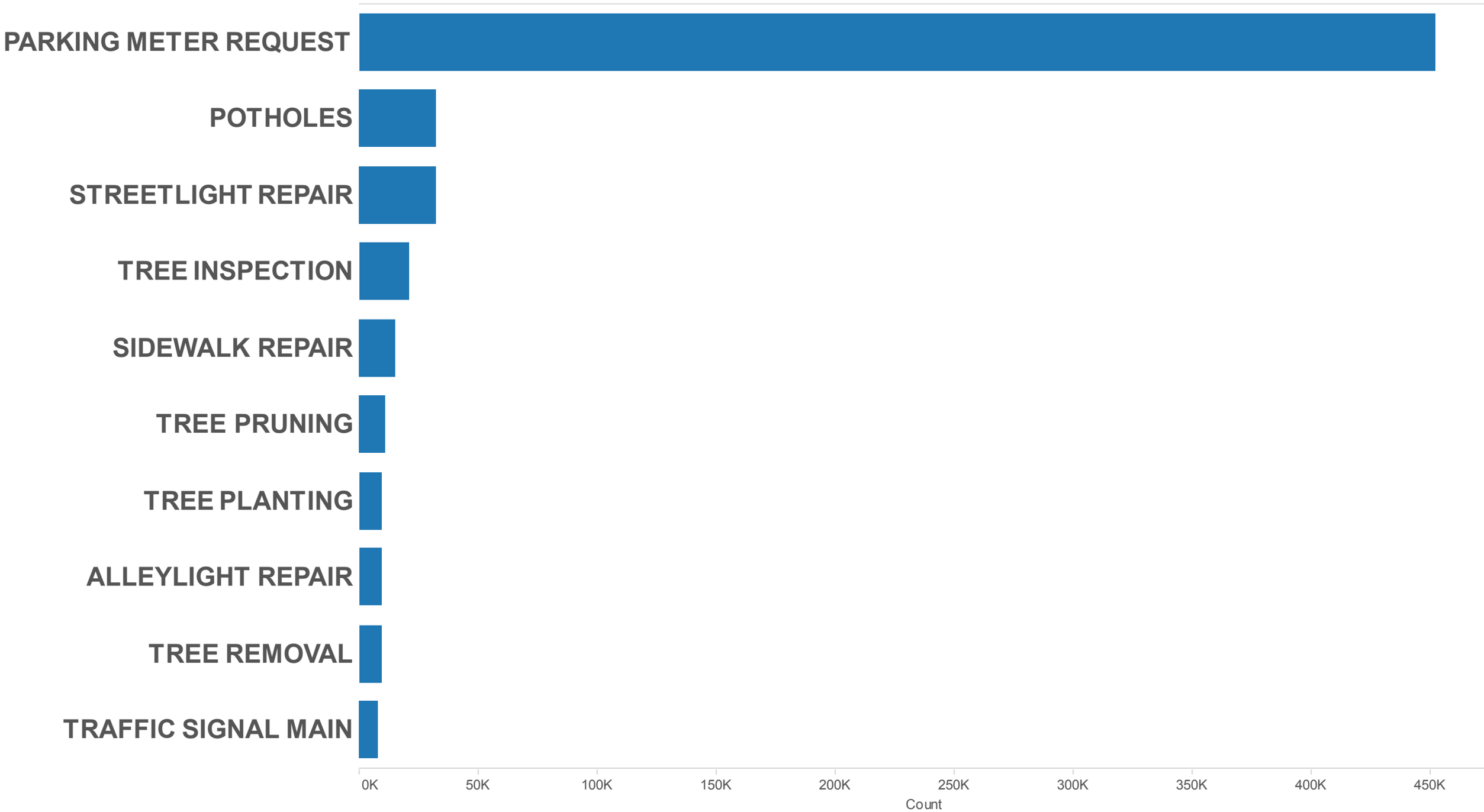
- Then we populated our factless fact table… but it didn’t work. Why?

```
%%sql
UPDATE req_fact
  INNER JOIN ddot1 ON (ddot1.objectid = req_fact.objectid)
  INNER JOIN day_dim ON (DATE(ddot1.initiateddate) = day_dim.full_date)
  SET req_fact.day_key = day_dim.day_key
```

- We created indexes for the attributes used in the join.

- Success!

Top Requests in DC 2009 - 2015



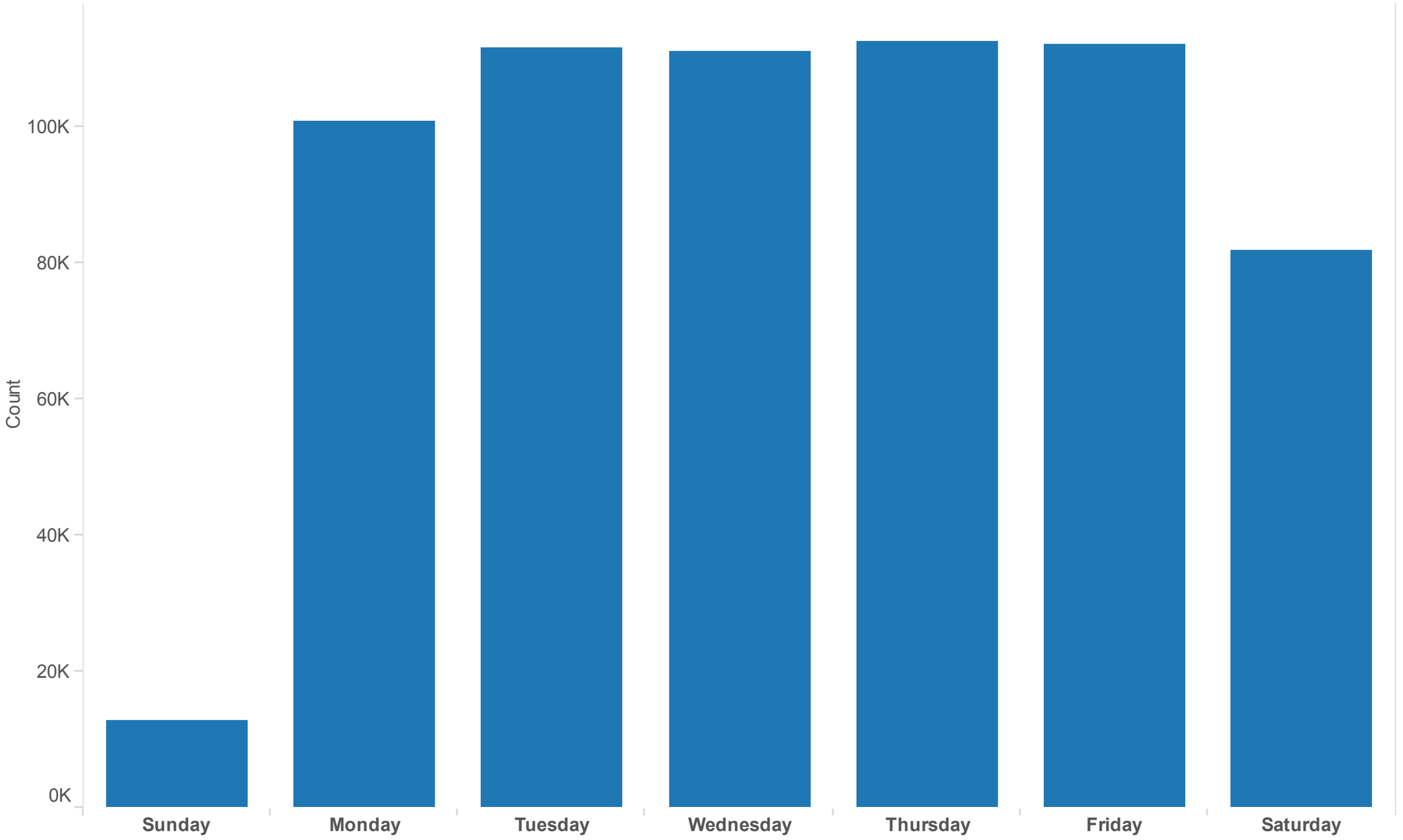
Can you park at a broken meter?

A person charged with a parking violation may contest the charge through an adjudication by mail or at an administrative hearing limited to one or more of the following grounds with appropriate evidence to support:

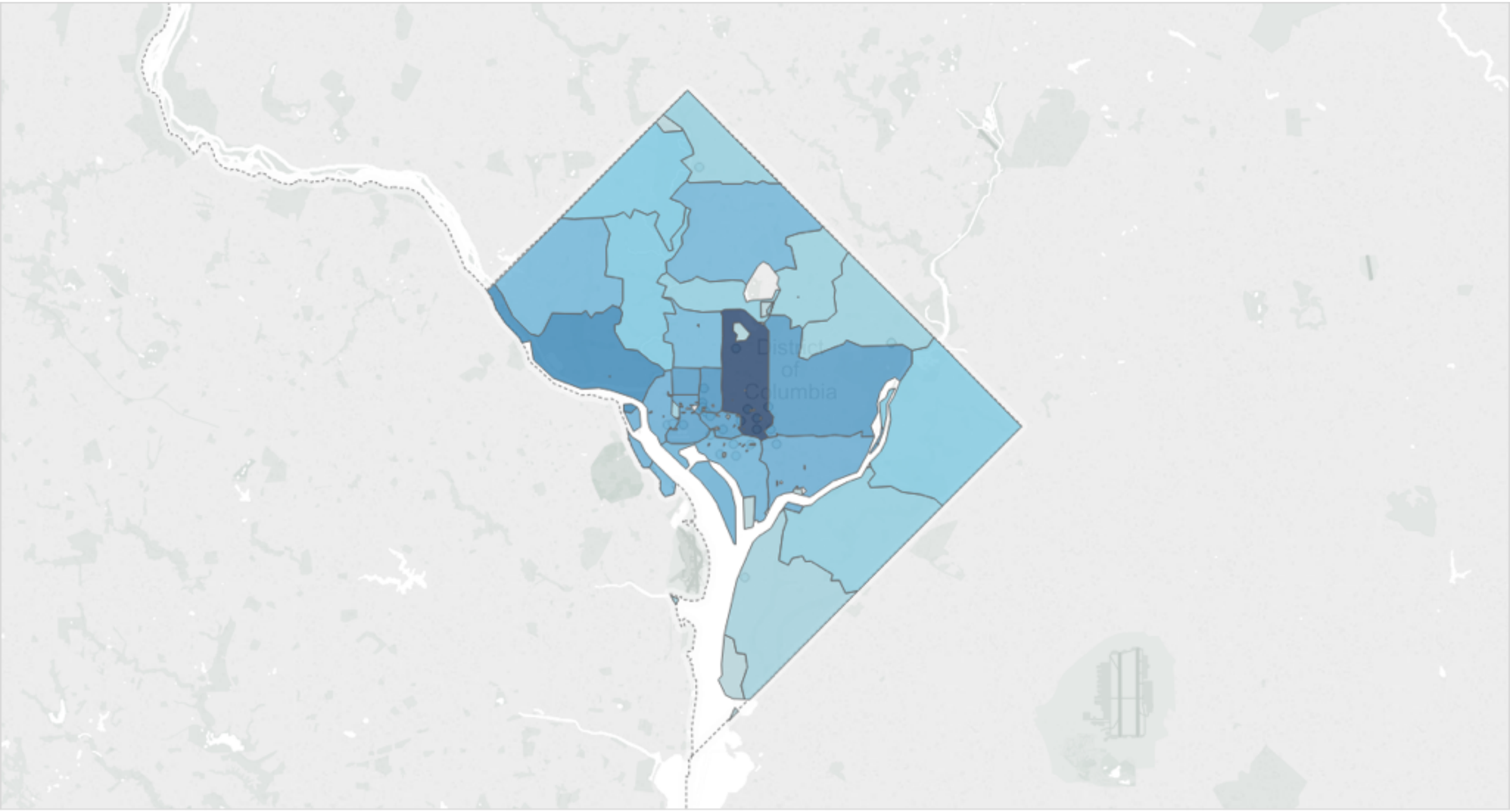
That the relevant parking meter was inoperable or malfunctioned through no fault of the respondent

§ 50–2303.05

Work Requests by Weekday



Mapped Requests by Zip Code



Calendar Heat Map for 2015

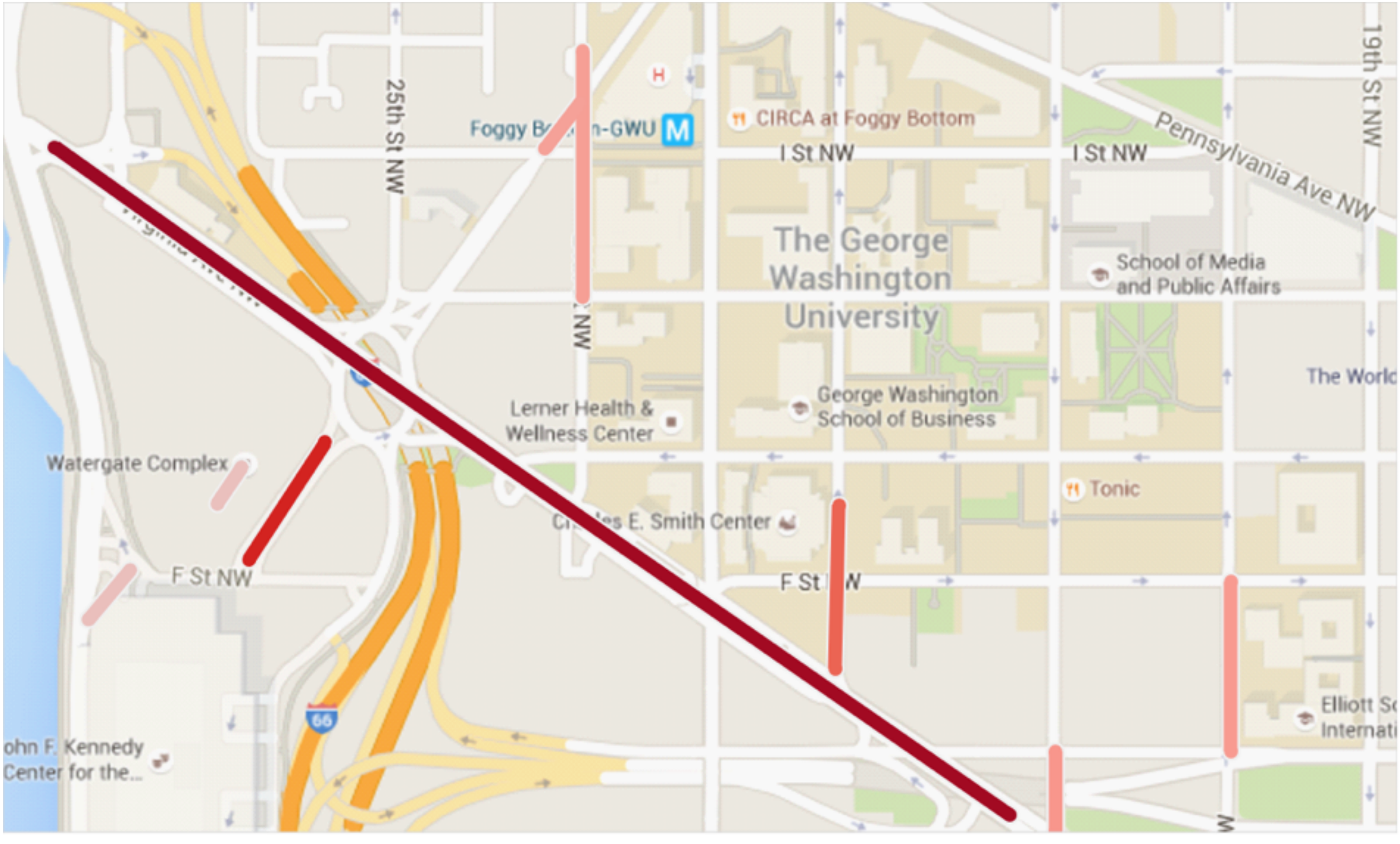
	Sunday	Monday	Tuesday	Wednesd..	Thursday	Friday	Saturday
January					1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
February	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
March	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
April				1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30		
May						1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31						
June		1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30				

	Sunday	Monday	Tuesday	Wednesd..	Thursday	Friday	Saturday
July				1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	
August							1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	31					
September			1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30			
October					1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
November	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30					

Count

4 — 1,361

Top 10 Foggy Bottom Repair Areas



FlowAmount
81 664