DataMade

Land Inventory System–Data Audit

Date: February 7, 2017
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Executive Summary

An audit of the City's Land Inventory System shows a number of problems in the data that can and should be addressed in future versions of the system.

As part of the expansion of the Large Lots program, DataMade was asked to identify properties that the City could confidently offer as eligible for purchase. In order to identify eligible properties, DataMade carried out an audit of the current Land Inventory System, in addition to other validation efforts.

The audit uncovered a number of problems in the data, which we detail. These are all data problems that could be addressed in the next version of the Land Inventory System.

Description of Data Received

On July 5, 2016, DataMade received a file, `LIS_Full_Report_With_Notes.xls` from Josephine Raya from the Department of Planning and Development. This file contained records on 30,224 unique PINs. There were 66,483 associated notes. There are 4,115 properties with a status of "Deleted from Inventory." We'll be ignoring these properties in this audit.[1]

The data file had the following fields:

PIN A 14 digit PIN to identify the parcel

LAddr The lowest address number associated with the parcel

Haddr The highest address number associated with the parcel

Street Dir Street Direction

Street Name Street Name

Street Type Street Type

Acquisition Method How the City acquired the parcel

Date of Disposition When the City got rid of the parcel

Dept Holding the Deed The City Department who has the deed

Dept To Hold For The City Department using the parcel, or intending to use the property

General Notes Free text field for notes

[1]The code and data for all these analyses can be found at `https://github.com/datamade/lis`.

Lot Vacant Indicator of whether the parcel has any buildings

Property Acquisition Date When the City acquired the parcel

Property Status Whether the parcel is owned by the city

Proposed Use *Not sure what this field means*

Field Audits

PINS

Currently Invalid Pins

There are 3,161 PINs that match no currently existing Cook County pin. Most of these are properties that are recorded as sold. The PINs of these properties may have changed after the city disposed of them.

However, there are nearly a thousand properties which the are recorded as owned by the city with PINs that do not match any existing parcel.

	status	count
1	Sold by City	2136
2	City Owned	609
3	City Owned Permanently Held	351
4	In Disposition	31
5	Leased	17
6	In Acquisition	16
7	Acquisition/Disposition	1

Address Mismatch

There are 1,401 properties where the PIN matches a currently valid parcel, but the addresses in the Land Inventory System do not match the address associated with the parcel in the Cook County Assessor's data. Again, most of these are properties that the city has disposed of. There are about six hundred properties that have an address mismatch and are currently held by the city.

	status	count
1	Sold by City	773
2	City Owned	385
3	City Owned Permanently Held	240
4	Leased	3

Acquisition Method

Redundant and Ambiguous Categories

The acquisition methods in the Land Inventory System contain types that are redundant or ambiguous, and sometimes both.

```
## Warning in postgresqlQuickSQL(conn, statement, ...):  Could not create executeselect acquisition_meth
count(*) from acquisition inner join lis using (pin) where acquisition_method is not null and
status != 'Deleted from Inventory' group by acquisition_method order by count(*) desc

## Error in UseMethod("xtable"):  no applicable method for 'xtable' applied to an object of
class "NULL"
```

Missing Data

```
## Warning in postgresqlQuickSQL(conn, statement, ...):  Could not create executeSELECT COUNT(*)
FROM lis LEFT JOIN acquisition USING (pin) WHERE acquisition_method IS NULL and status != 'Deleted
from Inventory'
```

There are properties missing a method of acquisition. The great bulk of these are properties that the city has disposed of. There are about sixteen hundred properties held by the city without an acquisition method.

```
## Warning in postgresqlQuickSQL(conn, statement, ...):  Could not create executeselect status,
count(*) from lis left join acquisition using (pin) where acquisition_method is null and status
!= 'Deleted from Inventory' group by status order by count desc

## Error in UseMethod("xtable"):  no applicable method for 'xtable' applied to an object of
class "NULL"
```

Acquisition Date

Missing Data

```
## Warning in postgresqlQuickSQL(conn, statement, ...):  Could not create executeSELECT COUNT(*)
FROM lis LEFT JOIN acquisition USING (pin) WHERE acquisition_date IS NULL and status != 'Deleted
from Inventory'
```

Very similar to acquisition method, there are properties missing an acquisition date. The great bulk of these are properties that the city has disposed of. There are about sixteen hundred properties held by the city without an acquisition date.

```
## Warning in postgresqlQuickSQL(conn, statement, ...):  Could not create executeselect status,
count(*) from lis left join acquisition using (pin) where acquisition_date is null and status
!= 'Deleted from Inventory' group by status order by count desc

## Error in UseMethod("xtable"):  no applicable method for 'xtable' applied to an object of
class "NULL"
```

Disposition Date

Missing Data

```
## Warning in postgresqlQuickSQL(conn, statement, ...):  Could not create executeselect count(*)
from lis left join disposition using (pin) where status='Sold by City' and disposition_date
is NULL
```

There are properties that have a status of "Sold by City" that do not have a disposition date. This is about % percent of the "Sold by City" properties.

Conflict with Acquisition Date

```
## Warning in postgresqlQuickSQL(conn, statement, ...):  Could not create executeselect count(*)
from acquisition inner join disposition using(pin) inner join lis using(pin) where disposition_date
< acquisition_date and status != 'Deleted from Inventory'
```

There are properties with a date of disposition that is earlier than the date of acquisition. This has two causes. First, users could have made a typos in entering either the disposition or acquisition date. Second, a property can be acquired and disposed of multiple times, and multiple transactions cannot be captured adequately in the current data model.

Department Holding Deed

Of the 16,105 properties held by the city, 3 are missing information on what department holds the deed.

General Notes

While, the general notes field is used for a myriad of purposes, there are a few common used that should be captured in separate fields.

- the previous owner of the property
- the entity who received a disposed property
- appraisal information
- stages of a disposition process

Lot Vacant

```
## Warning in postgresqlQuickSQL(conn, statement, ...):  Could not create executeselect count(distinct
pin) from lis inner join parcel ON replace(pin, '-', '')=pin14 inner join osm_buildings on st_intersects(
osm_buildings.geom) where vacant = True and status in ('City Owned', 'City Owned Permanently
Held', 'Leased')
```

Of the 12,734 city-held properties coded as vacant that match a current parcel, contain some building footprint. The building footprint data comes from an August 2016 extract from OpenStreetMap and is an improved version of the city's building footprint data published on the City's data portal.

Property Status

Overloaded Meanings

The "Property Status" field combines four distinct concepts that should be separated—ownership, permanently held, archival status, and whether the property is involved in a pending transaction. For every property, these attributes should be unambiguous and tracked separately.

Ownership "City Owned", "Sold by City"

Mix of Ownership and Permanently Held Status "City Owned Permanently Held"

Pending Transaction "In Disposition", "In Acquisition", "Acquisition/Disposition"

Uncertain Ownership Status

Depaul University's Institute of Housing Studies was engaged to confirm the ownership status of properties in the Land Inventory System. The institute has negotiated a data sharing agreements with the Cook County Tax Assessor and Recorder of Deeds.

For 18,772 properties, the Institute was able to match the PIN and did not find a conflict in address information between Land Inventory System and County sources. For these properties, the Institute coded whether the city owned the property as 'likely held' by the city, 'likely sold' or 'unknown' (See Appendix for details). For every property status they found many properties that seem to have a different ownership status than recorded in the Land Inventory System.

	status	likely_held	likely_sold	unknown	total
1	City Owned	9040	410	272	9722
2	Sold by City	439	3287	3090	6816
3	City Owned Permanently Held	1924	100	155	2179
4	Leased	40	4	8	52
5	In Acquisition	1	0	2	3

Table 1: All Zones

	status	likely_held	likely_sold	unknown	total
1	Sold by City	130	687	854	1671
2	City Owned	805	64	36	905
3	City Owned Permanently Held	426	59	98	583
4	Leased	7	0	7	14
5	In Acquisition	1	0	0	1

Table 2: All Zones, Outside of Large Lots Area

Summary

The basic task of a land inventory system must be to keep an accurate account of which properties are owned by the City. This is undermined by invalid or incorrect PIN, missing data on when a property was acquired, key details of the acquisition, and ambiguous property statuses.

	status	likely_held	likely_sold	unknown	total
1	City Owned	5878	267	151	6296
2	Sold by City	264	2021	2081	4366
3	City Owned Permanently Held	68	7	14	89
4	Leased	7	0	0	7

Table 3: Zoned Residential

	status	likely_held	likely_sold	unknown	total
1	Sold by City	76	361	564	1001
2	City Owned	480	41	14	535
3	City Owned Permanently Held	25	2	11	38
4	Leased	5	0	0	5

Table 4: Zoned Residential, Outside Large Lots Area

The second task is to track whether a property is currently being used by a City, whether there is an imminent plan for the property, or whether the property is currently available for a new use. This information inevitably becomes stale, so there should be plans for recurring use audits, particularly for planned uses. A system should allow for auditors to view when 'current use' or 'planning hold' fields were last updated.

A land inventory system can do more, but any new system must prioritize getting these first two tasks right.

	status	likely_held	likely_sold	unknown	total
1	City Owned	5398	226	137	5761
2	Sold by City	188	1660	1517	3365
3	City Owned Permanently Held	43	5	3	51
4	Leased	2	0	0	2

Table 5: Zoned Residential, Inside Large Lots Area

	status	likely_held	likely_sold	unknown	total
1	City Owned	1044	50	46	1140
2	Sold by City	35	310	253	598
3	City Owned Permanently Held	155	4	33	192
4	Leased	2	0	1	3

Table 6: Zoned Business

	status	likely_held	likely_sold	unknown	total
1	City Owned	464	14	11	489
2	Sold by City	23	161	170	354
3	City Owned Permanently Held	88	7	11	106
4	In Acquisition	0	0	1	1

Table 7: Zoned Commercial

	status	likely_held	likely_sold	unknown	total
1	City Owned	678	11	7	696
2	Sold by City	9	93	65	167
3	City Owned Permanently Held	88	12	14	114
4	Leased	2	0	0	2
5	In Acquisition	1	0	0	1

Table 8: Zoned Manufacturing

	status	likely_held	likely_sold	unknown	total
1	City Owned Permanently Held	19	11	7	37
2	Sold by City	0	8	17	25
3	City Owned	9	0	1	10
4	Leased	0	0	1	1

Table 9: Zoned Downtown