

PARCEL CHANGE DETECTION



ALL PARCEL CHANGES

Pushpin recognizes all parcel changes, not just changes to the main structure



CATEGORIZED RESULTS

Pushpin classifies changes into 10 categories, facilitating desktop review prioritization



< 4 WEEK TURNAROUND

Pushpin is 10X faster than the competition, completing countywide projects in weeks



25¢ PER PARCEL

Pushpin is 3X cheaper, charging just 25¢ per parcel for projects with 100K+ parcels

Change Report

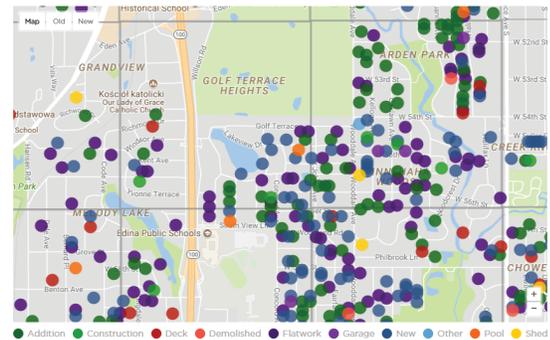
Edina

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Overview

Project Name	Edina		
Created	August 11, 2017		
Sectors	53		
Total Parcels	11,637		
Changed Parcels	1,562		13%
Unchanged Parcels	10,075		87%
Reviewed Parcels	1,164		10%
Reviewer Agreement	1,081		93%
Assessed Value Increase	\$72,490,000		
Annual Tax Increase	\$724,900		
Old Imagery	http://gis.hennepin.us/arcgis/services/Imagery/UTM_Aerial_2009/MapServer/WMSServer		
New Imagery	http://gis.hennepin.us/arcgis/services/Imagery/UTM_Aerial_2015/MapServer/WMSServer		

Map



Try for Free

Changes

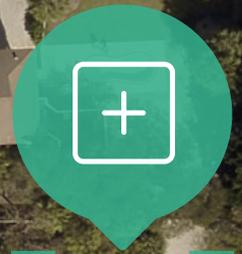
Type	Count	Frequency
Addition	424	3.6%
Construction	33	0.3%
Deck	117	1.0%
Demolished	7	0.1%
Flatwork	996	8.6%
Garage	45	0.4%
New	274	2.4%
Other	35	0.3%
Pool	29	0.2%
Shed	41	0.4%

Tax Impact

Type	Count	Unit Value	Total Value	Tax Impact
Addition	424	\$38,000	\$16,112,000	\$161,120
Construction	33	\$6,000	\$198,000	\$1,980

Deep learning applied to aerial imagery

Semi-automated change detection and feature extraction



Addition

METHODOLOGY

- Pushpin provides a next-generation property change detection service leveraging a patent-pending, semi-automated workflow that consistently achieves human-level accuracy or better. Pushpin flags changed parcels, indicates one or more change type, and divides parcels into geographic sectors. Pushpin's accelerated workflow enables us to turnaround county change detection projects with hundreds of thousands of parcels in less than four weeks.
- Pushpin developed the world's largest parcel change detection training set. Each sample in the training set contains a parcel boundary with old and new high-resolution, leaf-off imagery.
- Pushpin then uses these samples to train, validate, and test a state-of-the-art convolutional neural network (CNN) to recognize changed parcels. Pushpin uses this custom neural network to automatically compare old and new images and classify each parcel as changed or unchanged.
- Pushpin breaks large projects into batches of 500 parcels. Pushpin first uses the neural network to classify all batches. Map analysts then review 10% of the parcels in each batch. If the label agreement is 95% or greater, the batch is complete. Otherwise, a map analyst manually classifies the batch and another analyst reviews the result. Using this approach, we consistently achieve a project accuracy of 95% or better.

DELIVERABLES

- Each client receives a detailed change report like the one shown on the previous page. The report provides an overview of the findings, map of the change locations color-coded by change type, an estimate of the tax impact for prioritization purposes, and a searchable listing of the individual sectors reviewed.
- In addition, Pushpin provides the customer with login credentials to the Pushpin site where the data are available online via an intuitive user interface. This also permits access to the data via mobile devices in the field that have wireless connectivity making field reviews far more efficient.

PRICING

- Pushpin charges 25¢ per parcel for projects with 100K+ parcels. For smaller projects, we charge 35¢ per parcel. Sign up for our trial and we will analyze 1,000 parcels for free.