Geospatial Competency Centre
Solution Development and Sustainment
Information and Technology

Address and Neighbourhood Validation

Project Name **Address and Neighbourhood Validation**	Project Acronym or No.	
Project Sponsor	Target Project Completion Date June - 2015	
Business Manager Lead Harvey Low	Version No. 1.0	Version Date 2015/05/04
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Business Requirement

Social Policy, Analysis and Research require two geospatial components to assist in driving navigation through their Neighbourhood Profiles pages on the City of Toronto's Internet Site.

(1) **Text Based Location Validation**: a web site visitor can enter an address, intersection or place name within the City of Toronto and confirm its validity.

(2) **Neighbourhood Determination**: The validated location from step 1 (above) can be used to determine which City Neighbourhood the validated location falls 'within'.

Document Information

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Revision History

Revision	Date	Status	Author	Reviewed By	Summary of Changes
1.0	May 4, 2015	Draft	Scott Webb		Initial Document

Document Distribution List

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1 Introduction

To enhance the current search functionality within the Neighbourhood Profile pages the Geospatial Competency Centre is proposing the use of two existing REST services.

The intention of these REST services is to provide both an accurate and standardized method for validating and querying data from the City's Geospatial Repository.

1.1 *GCCREST01: Location Validation*

For the location validation component, the City's **rankedsearch** REST Service can be utilized.

Of note with the use of this service:

- **A one box text entry is strongly recommended**, rather than separating the address number and street name component into two separate input boxes.

- The rankedsearch REST service utilizes Oracle Soundex functionality. In other words, phonetic representations of the input text will still be matched. For example:
    - '1 Young Street' suggests '1 Yonge St'
    - '1 Yung St' suggests '1 Yonge St'
    - '18 Dyes' suggests '18 Dawes Rd' and '18 Dyas Rd', user would select appropriate location

- The rankedsearch REST service will also validate intersections and some** common place names. For example:
    - 'Metro Hall' suggests '55 John St, M5V3C6'
    - 'Rogers Centre' suggests '1 Blue Jays Way'
    - 'King and John' suggests 'King St W / John St' and 'Kingsdale Ave / John Mckenzie Gt', user would select the appropriate location

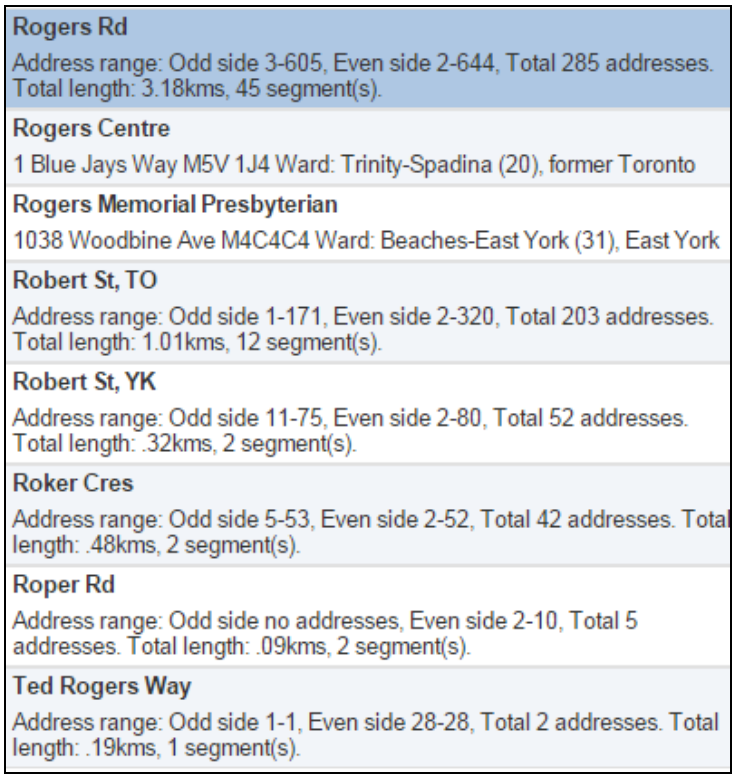
  ** Common place names that can be located with this service include landmarks, schools, parks, churches, police stations, etc.

Interpreting Results:

The JSON return from this service contains a significant amount of information.

Depending on the text string submitted to the service, the return can be one exact match to dozens of 'close matches'. The key piece of information attached to each result record is the "score" (numeric value from 0 to 100). The rankedsearch service utilizes a 'scoring' algorithm in conjunction with the SoundEx functionality to determine the most probable or most likely results. It is suggested that in the case of multiple records returned, a list (sorted on score) could be presented to the user to allow further user input to pinpoint the desired result. See example below.

A rather ambiguous search with the text string 'Rogers' returns 8 results. The list below orders the results based on "score".



User Tips:

Set **&retRowLimit** property to manageable number (example 10), to limit the number of likely matches that the service will return. Ambiguous searches can return 100's of records.

The result can be JSON (**f = json**), PJSON (**f = pjson**), XML (**f = xml**) format.

Leave **searchArea=1**. This sets the search to the City of Toronto.

Leave **matchType=1**. This returns all results.

Leave **projectionType=1**. This projection (WGS84) returns latitude & longitude values for each location.

The services can be called from the **Intranet** or **Internet**. To call the service, add the user entered text in the identified location below in **red** in the call.

Example:

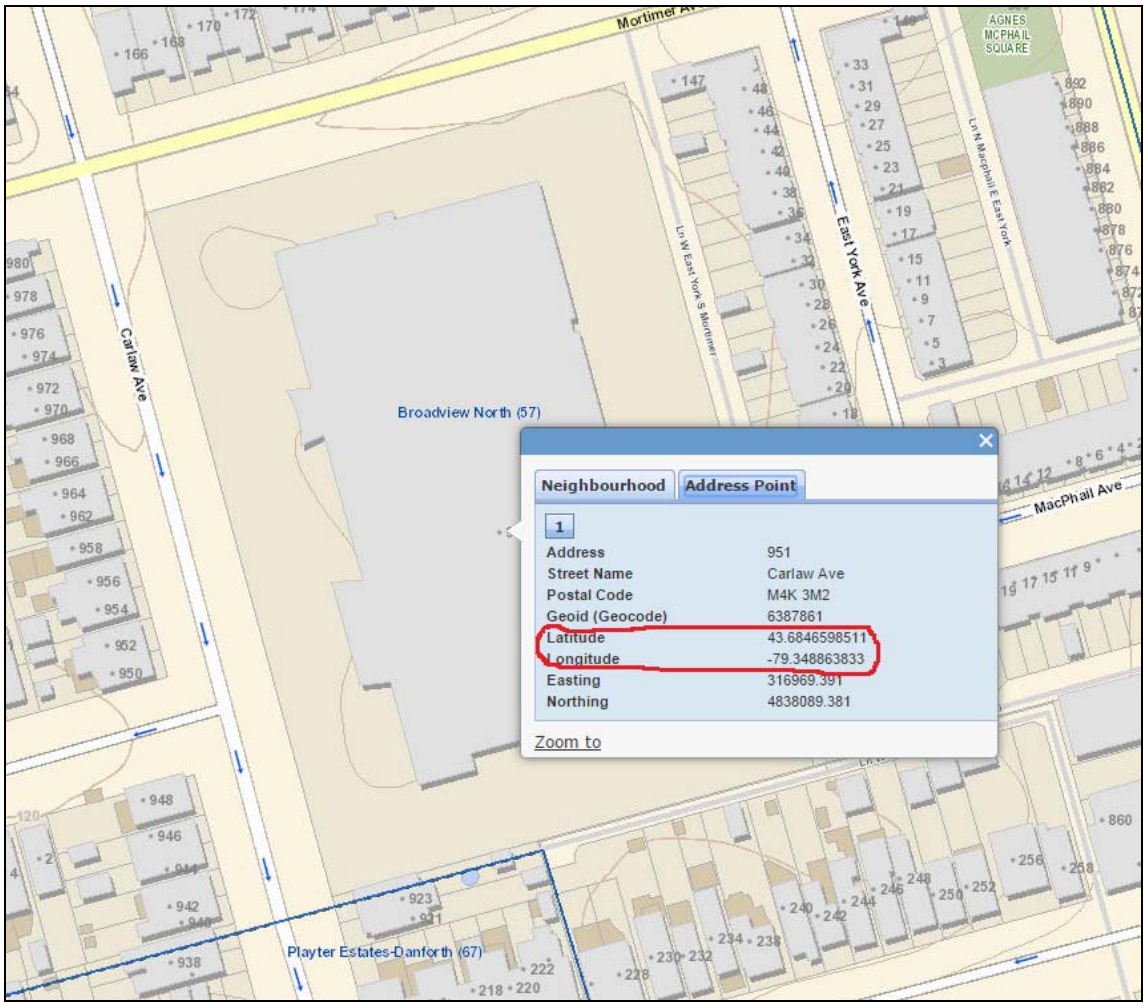
http://insideto-map.toronto.ca/geoservices/rest/search/rankedsearch?searchString=**queen**&searchArea=1&matchType=1&projectionType=1&retRowLimit=10

http://map.toronto.ca/geoservices/rest/search/rankedsearch?searchString=**queen**&searchArea=1&matchType=1&projectionType=1&retRowLimit=10

1.2 *GCCREST01: Neighbourhood Determination*

To determine which official City Neighbourhood the validated location from step one above "falls within", a REST query to the City's Map Service **cot_geospatial_webm** will provide the desired result.

This service essentially executes a "point in polygon" query, where the latitude and longitude values parsed from the JSON return in Step 1 are passed to the Map Service cot_geospatial_webm. Conceptually the following spatial query is executed by the map service.



The only parameters that are required to execute the service call are highlighted in **red** below. The longitude and latitude values for any validated location within the City are obtained from the rankedsearch service.

Additional note: To create redundancy with this service call, there are two URL's provided below which will route to either **primary** or **secondary** (failover) map services.

PRIMARY:

http://gis.toronto.ca/arcgis/rest/services/**primary**/cot_geospatial_webm/MapServer/265/query?where=&text=&objectIds=&time=&geometry=**-79.421931%2C43.632799**&geometryType=esriGeometryPoint&inSR=4326&spatialRel=esriSpatialRelWithin&relationParam=&outFields=AREA_ID%2CAREA_SHORT_CODE%2CAREA_NAME&returnGeometry=false&maxAllowableOffset=&geometryPrecision=&outSR=3857&returnIdsOnly=false&returnCountOnly=false&orderByFields=&groupByFieldsForStatistics=&outStatistics=&returnZ=false&returnM=false&gdbVersion=&returnDistinctValues=false&returnTrueCurves=false&resultOffset=&resultRecordCount=&f=pjson

FAILOVER:

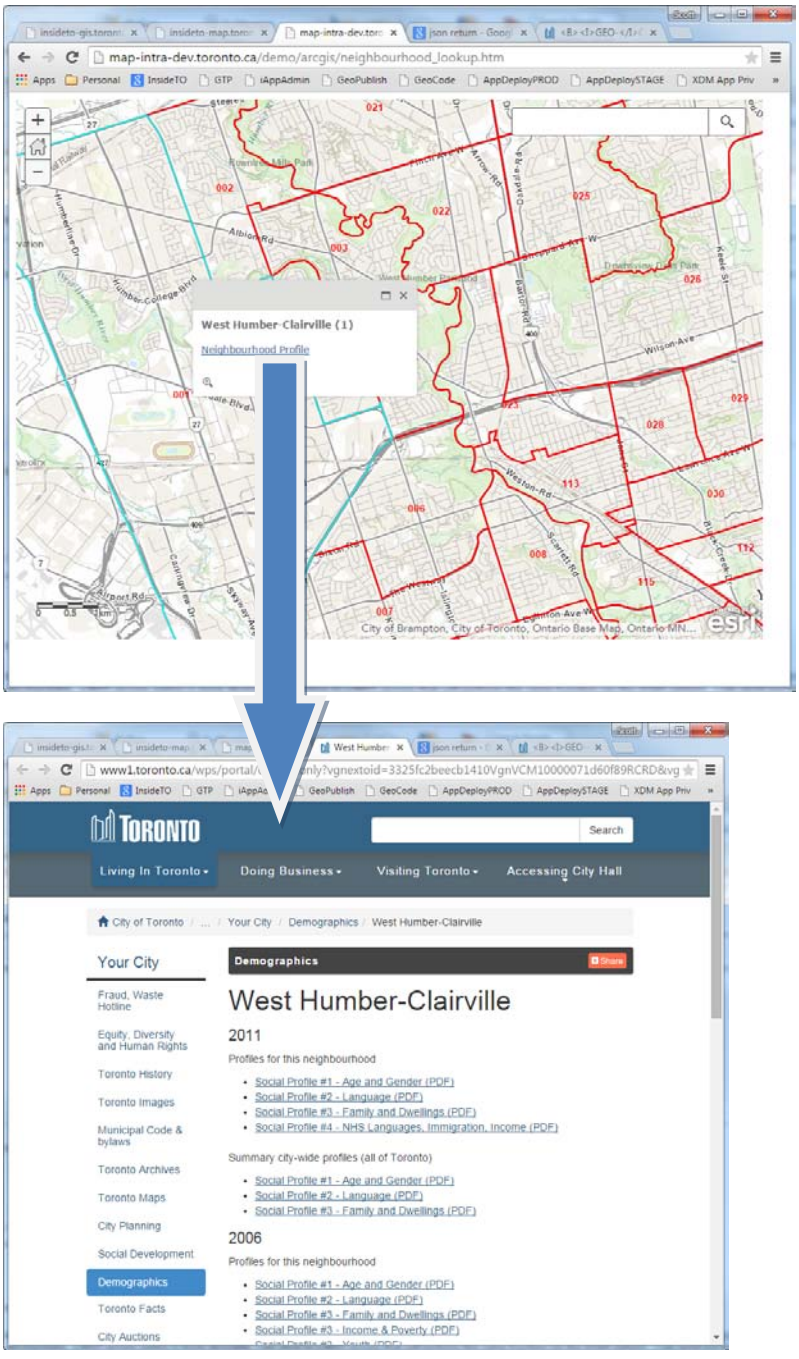
http://gis.toronto.ca/arcgis/rest/services/**secondary**/cot_geospatial_webm/MapServer/265/query?where=&text=&objectIds=&time=&geometry**=-79.421931%2C43.632799**&geometryType=esriGeometryPoint&inSR=4326&spatialRel=esriSpatialRelWithin&relationParam=&outFields=AREA_ID%2CAREA_SHORT_CODE%2CAREA_NAME&returnGeometry=false&maxAllowableOffset=&geometryPrecision=&outSR=3857&returnIdsOnly=false&returnCountOnly=false&orderByFields=&groupByFieldsForStatistics=&outStatistics=&returnZ=false&returnM=false&gdbVersion=&returnDistinctValues=false&returnTrueCurves=false&resultOffset=&resultRecordCount=&f=pjson

Sample JSON Return:


```
{
  "displayFieldName": "AREA_NAME",
  "fieldAliases": {
    "AREA_ID": "AREA_ID",
    "AREA_SHORT_CODE": "AREA_SHORT_CODE",
    "AREA_NAME": "AREA_NAME"
  },
  "features": [{"attributes": {
    "AREA_ID": 2.5886988E7,
    "AREA_SHORT_CODE": "082",
    "AREA_NAME": "Niagara (82)"
  }}]
}
```

1.3 *MAP01: Neighbourhood Determination by Embedded Map*

Presenting an embedded map on a webpage is an additional method to drive navigation for the end user. A mockup was created in ESRI's ArcGIS Online displaying City Neighbourhoods that could be expanded upon to drive navigation within the Neighbourhood Profiles web pages:



Some advantages to the ESRI ArcGIS Online approach:

- Embedded map can be created and managed by staff at Social Policy, Analysis and Research through their divisional ArcGIS Online account
- Embedded map utilizes current and accurate City of Toronto streets, addresses, topographic data in addition to the City's Neighbourhoods map layer that is managed by Social Policy, Analysis and Research
- Map has pan/zoom/address lookup capabilities
- Map can be viewed within a browser, desktop or mobile device