Transportation Tomorrow Survey Software

Transportation Tomorrow Survey Software (TTSS)

- Transportation Tomorrow Survey Software (TTSS) is a custommade software package used to carry out all aspects of the survey from sample management, to interviewing, coding, and post-processing tasks.
- Created for the 2006 survey, it was updated for the 2011 survey.
- No changes to its function for 2016 other than removing web interview option.
- TTSS comprised of six external modules built around a Sample Management System (SMS) backend.

Transportation Tomorrow Survey Software (TTTS)

- > TTSS comprised of:
 - Sample Management Software (SMS) (backend)
 - Administration Console (AC)
 - Direct Data Entry Console (DDE)
 - Monitoring Console (MC)
 - Geocoding Console (GC)
 - Reference Data Update Module (REF)
 - Post-Processing Module

Sample Management Software (SMS)

- Backend for TTSS
- Not directly accessed by users. Accessed through Administration Console and other modules
- Used to manage survey household samples
- Uses processing rules to determine which individual and class of users have access to specific samples
 - E.g.: can be used to hold back new interviewing sample until pre-interviewing letters have reached households or for assigning different geographical areas to specific coders
- Used to search for specific sample.

Sample Management Software (SMS) (cont'd)

- Carries out nightly transition (at 2 AM) whereby:
 - Performance statistics and reports are generated
 - Batch geocoding is completed
 - Suitable sample progresses through the various sample states to completion: i.e interviewing to reviewing, reviewing to geocoding, geocoding to post-processing.

Administration Console (AC)

- > One of the applications through which the SMS is accessed.
- Used by the management team.
- Provides easy to use interface for accessing all administrative functions such as:
 - Assigning users to specific groups/roles: management, interviewers, foreign language interviewers, supervisors, geocoders etc.
 - Turning on and off mailing blocks for interviewing
 - Assigning different interview date if necessary
 - Generating reports
 - Displaying historic transactions on individual survey records
 - Allocating interview staff to interview stations
 - Displaying status of geocoding sample by coding zone

Direct Data Entry (DDE)

- Used by the interviewers and reviewers to access individual samples for phone interview or review editing
- Allows the interviewer to enter collected survey information and progress through the proper sequence of the TTS questionnaire to complete interviews
- Allows interviewer to schedule call-back times for incomplete surveys
- Contains built-in validation and logic checks to ensure the validity of information entered e.g.: checks that transit routes entered for a trip connect, person is old enough to have a drivers license etc.
- Allows reviewers (after confirmation via callback or clarification) to correct or add missing information to households which were previously incomplete
- Doubles as the Post-Processing Module

Monitoring Console (MC)

- Used by the team leaders and supervisors to visually monitor the live interviewing DDE for quality control purposes.
- Used in conjunction with audio monitoring of the live interview.
- Specific interviewers can be chosen for monitoring based on workstation or id number.
- Used by geocoding supervisor to monitor live geocoding.
- Installed only on the supervisor workstations.

Geocoding Console (GC)

- Used by the coders to add coordinates to previously uncoded survey locations.
- Highlights un-coded locations and gives coders the options to code the locations using street addresses, intersections or a set monument and school file.
- Allows coders to examine historic representations of the household.

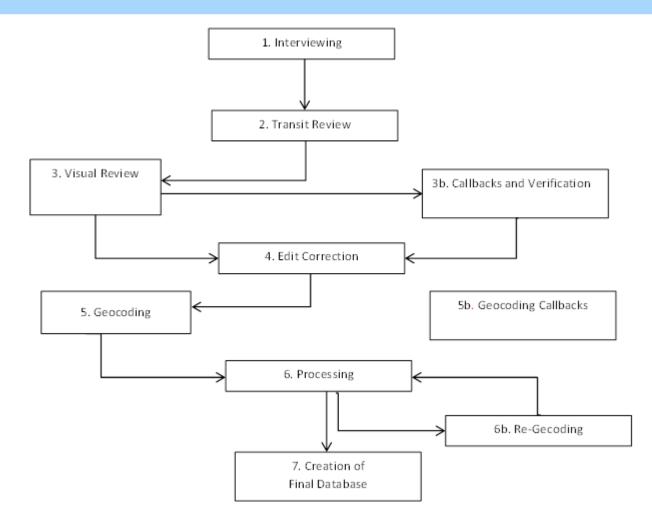
Reference Data Update (REF)

- Allows the geocoding supervisor to update the school and monument databases used in the DDE and GC.
- Connected to a map interface which allows the user to see the location of a newly added and coded location in space to avoid error.
- Used by coders to determine whether new schools and monuments that they have discovered have already been added to the pending database additions.

Post-Processing Module

- DDE becomes the Post-Processing module in post processing.
- Used by post-processing staff.
- Shows a list of the errors and the number of samples with each error.
- Allows users to select households with errors in an attempt to work through the collected information and fix errors.

TTS Processes



- 1. Interviewing
 - AC to assign sample to specific interviewers, turn on and off mailing blocks, generate reports
 - DDE to conduct interview
 - MC to monitor interview
- 2. Transit Review
 - PDF files generated from interviewing phase
- 3. Visual Review
 - PDF files generated from interviewing phase

- 3b. Callbacks and Verification
 - DDE to callback household
 - MC to confirm callbacks actually take place
- 4. Edit Corrections
 - DDE to make changes or add information to households
 - AC to pass completed surveys to geocoding phase

- 5. Geocoding
 - Geocoding console to assign coordinates to uncoded locations
 - Reference Data Update software to add new schools and monuments to database
 - Administrative Console:
 - pass completed households to Post-Processing
 - Assign different geozones to individual geocoders
 - Create reports on Geocoders statistics
 - Monitoring Console for supervisors to monitor live geocoding as necessary

- 5.B Geocoding Callbacks
 - DDE to callback household
 - GC to make coding changes after callback
- 6. (Post) Processing
 - AC to assign households to users
 - DDE /Post Processing Module to work through households and fix errors
- 6.b Re-Geocoding
 - GC to make coding changes

- 7. Creation of Final Database
 - Database dump from SMS

Additional Information on Software

- 2006 TTS: Design and Conduct of the Survey: Section 3 Software Development http://dmg.utoronto.ca/pdf/tts/2006/conduct2006.pdf
- 2006 TTS Working Paper Series: Interview Manual http://dmg.utoronto.ca/pdf/tts/2006/interview2006.pdf
- 2006 TTS Working Paper Series: Coding Manual http://dmg.utoronto.ca/pdf/tts/2006/geocode2006.pdf
- 2011 TTS: Design and Conduct of the Survey: Section 3 Software Development

http://dmg.utoronto.ca/pdf/tts/2011/conduct2011.pdf

Geocoding Console

Geocoding

- Geocoding is the process by which x-y coordinates are assigned to the location information collected in the TTS
- TTS information is checked for accuracy by the daytime visual editors and the reviewers before it can be passed to geocoding

Geocoding

- Location information collected by interviewers can be classified as three types:
 - Addresses: Street Addresses including street number, street name and municipality e.g. 500 University Ave, Toronto
 - Intersections: The two cross streets and the municipality e.g. College St & Yonge St, Toronto
 - Monuments: A name of a location or a detailed description of its location e.g. Union Station, Toronto or Metro Supermarket near College & Ossington Ave, Toronto

Geocoding

> There are two types of geocoding processes:

Batch geocoding

- An automated process carried out in an attempt to geocode as many locations as possible.
- Uses the TTS databases to look for exact matches to information in the completed interviews
- Manual geocoding
 - A coder uses the Geocoding Console (GC) as well as the internet, phone book and any reference material to find coordinates for an locations not coded in the batch process

Geocoding Console (GC)

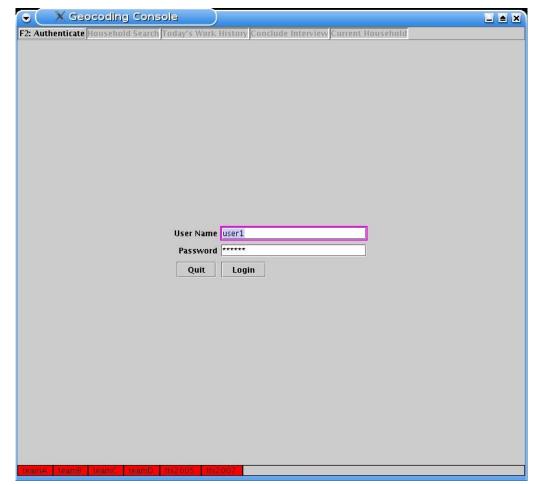
- Used by the coders to add coordinates to previously uncoded survey locations.
- Highlights un-coded locations and gives coders the options to code the locations using street addresses, intersections or a set monument and school file.
- Allows coders to examine historic representations of the household.

Geocoding Console (GC)

- > The Geocoding Console contains 5 separate tabs:
 - Authenticate
 - Household Search
 - Today's work history
 - Conclude Interview
 - Current Household

Authenticate tab

Used to log into and out of the GC



Household Search tab

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Household Search Tab

- Households can be specifically selected for coding by entering an id number or the household phone number.
- By leaving the search index box empty and clicking on Get Household, randomly assigned households will be selected for coding.
- Clicking the Household History button will bring up a new window in which the user can examine a snapshot of the specific states a household has been through in its history to that point.
 - This is useful for coders as information can sometimes be changed in review, which may be useful to the coding process

Today's work history tab

- Similar to the tab in the DDE software this tab (no screenshot available):
 - Gives a list of all of the households accessed in GC by the current user
 - Contains information on the household id, the time the household was last accessed and the current state of the household
 - Current state of the household includes: whether all locations are coded, the household is rejected in geocoding, it requires a callback, or it requires an update to the reference information.
- Clicking on any household gives the user the option to reopen that household

Current Household tab

🗙 Geocoding Console testingSMS Geocoding Console; rb503 • _ ≜ × Conclude Interview F2: Current Household NOBODY1056 777 BAY ST TORONTO 123-1056 Household ID: 221282 **Dwelling Type: A** Language: English Trip Date: Mon 17 Mar 2008 People: 2 Vehicles: 1 section 1 Age Sex Lic Pas E... Occ Typ # Label Work Stu Typ School 42 M Y M F P M TOWN CENTRE SCARBOROUGH, TORONTO 1 Respondent N F3: Trips Transit Routes F6: next location - F7: find reference owner - F8: next error location - F9: previous location/reference - F10: reselect current location/reference - F11: mark c Purp Mode Type Per# Trp# Time Original Type Current HOME A 777 BAY ST, TORONTO A 777 BAY ST, TORONTO 1 WORK M TOWN CENTRE SCARBOROUGH, SCARBOROUGH M TOWN CENTRE SCARBOROUGH, TORONTO 1 ORGN HA 777 BAY ST. TORONTO HA 777 BAY ST. TORONTO 1 730a W D WM TOWN CENTRE SCARBOROUGH, SCARBOROUGH WM TOWN CENTRE SCARBOROUGH, TORONTO SHOPPERS DRUG MART AT MCCOWAN & LAWRENCE, T., M SHOPPERS DRUG MART AT MCCOWAN & LAWRENCE, T., 1 2 1240p M D M **Original Location** F4: New Current Location Error Table Error Message(s) Location Type: Address Location Type: Address et Name: BAY ST nicipality: TORONTO ing Type: ONLINE ing Type: ONLINE irce Type: STREET irce Type: STREET Clear Restore F5: List Street Range STARTING 🔻 Street: ▼ Number: EXACTLY 🔻 Search Street Name L Start L End R Start R End X Street Municipality CSD Start Coord End Coord Ar. testingSMS

- For simplicity, we will divide the Current Household page into 4 sections.
- Section 1 (top)
 - Shows some general household and person information for the current household which can be used as reference information.
 - The codes listed for the various fields are referenced in the interview manual <u>http://dmg.utoronto.ca/pdf/tts/2006/interview2006.pdf</u> and also the 2011 TTS data guide <u>http://dmg.utoronto.ca/pdf/tts/2011/dataguide2011.pdf</u>
 - Not editable by coders

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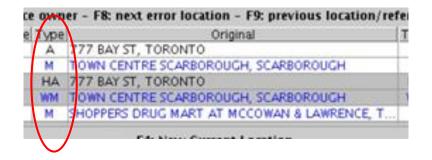
Contains two tabs: Trips and Transit Routes

Trips Tab

- Shows collected location information for home address, and school location, work location and location of trips
- Information includes person #, trip #, time of trip (only for trip locations), trip purpose, trip mode, coding type, original and current
 - Coding type is a one or two word code representing the type of location information recorded.

Trips tab (cont'd)

- Coding type examples
 - M Monument
 - I intersection
 - A Address



- WM Workplace coded as a monument
- HA Home coded as an address
- XA, XM,XI the first letter X means the location is linked to another location recorded previously in the current household and the second letter is the way it was coded: A – address, M monument etc.

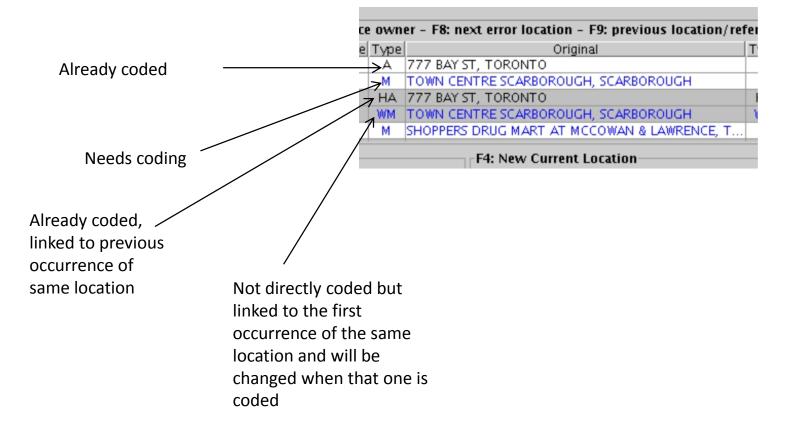
Trips Tab (cont'd)

- Original
 - The last location information recorded in the household file prior to it being sent to coding
- Current
 - The current location information as it exists in the household
 - This is the field that changes when geocoding occurs

Trips Tab (cont'd)

- The Trip tab is colour coded
 - Black Text represent already coded households
 - Blue Text represents locations in need of coding
 - White background represents the first occurrence of a particular location
 - Grey background represents locations linked to others in the survey and which cannot be directly geocoded
- Coding can only be done on locations which have blue text and a white background
- A household is completely coded when all blue coloured text is now black

Trips Tab (cont'd)



Trips Tab (cont'd)

- At the top of the trip information there is also a list of shortcut keys that can be used to speed up geocoding. For example:
 - □ F8 Allows access to the next uncoded location
 - F7 allows one to find the original reference to a location currently selected
 - A list of the other shortcut keys is given on page 9 of the 2006 Coding Manual <u>http://dmg.utoronto.ca/pdf/tts/2006/geocode2006.p</u> <u>df</u>

Transit Route Tab

- If transit was used as the mode for trip to the current location being worked on then this tab will show the transit routes, access and egress information for that trip.
- This can sometimes come in handy when trying to determine locations.

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- Section 3
 - Divided into 3 vertical sections
 - Original Location
 - New Current Location
 - Error Table

Original Location

- When a location is selected for coding this shows the information related to the originally coded location including
 - Location type
 - Coding type How the location was coded
 - Online batch coded
 - □ Manual coded by a geocoder
 - Uncoded
 - X-Y Coordinates

New Current Location

- This section allows users to geocode the current location
- Location type can be changed so that for example a monument may be coded to an address or intersection

New Current Location (cont'd)

- Users can
 - Update: Will move the information in this section and fill in the blue text locations located above in Section 2 hence facilitating geocoding.
 - Clear: Clears all contents from the text boxes in this section
 - Restore: Changes current content of text boxes to their original pre-coded state
 - □ Fill in: takes the current info in this section and fills it into section 4 for manipulation.

> Error Table

- Shows a list of error messages generated for the location being presently coded. These error messages describe the reason why the locations could not be batch coded. Examples of the error messages generated include:
 - Coordinates missing
 - Streets do not intersect
 - Municipality not found in reference database

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datamanagementgroup

Section 4

Section 4

- This section gives users access to the reference data files in order to geocode locations
- Six reference databases are available for coding via separate tabs. These are
 - Monument
 - Schools
 - Intersection
 - Places within the Survey Area
 - Places beyond the Survey Area
 - Street Ranges (street address information)

- Section 4 (cont'd)
- Information is
 - Then manipulated to effect coding
 - For example, if the Town Centre Scarborough monument location from section 2 was selected into section 3 and filled in to section 4 we would be able to manipulate the monuments list and search to see if there is a monument that fits the description. Once a suitable monument match was found, clicking on it would allow it to be imported into the New Current Location tab is section 3 for coding.

Conclude Interview

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Conclude Interview

Conclude Interview

- After coding is complete the Conclude interview tab is used to close the current household
- If any of the previously uncoded locations have not been coded the software will not allow the user to mark the interview as complete
- This tab also allows the user to add comments to the household and set household status to "callback required" if there is too little information to code a location
- A list of completion codes for coding is given on page 14 of the 2006 Coding manual
- Validation errors show a list of errors remaining for the household. All errors listed may not be coding related

Coding Procedure

> The full Coding Procedure is:

- Get Household
- All locations requiring coding will be shown in the Trips tab (Section 2 of the Current Household tab) as blue text on a white background
- Select the first location to code using F8
- This location's info will be shown in the New Current Location box (Section 3)
- Use this box to change the information and location type as necessary
- Fill in to get the information to the reference databases (Section 4)

Coding Procedure

Coding Procedure (cont'd)

- Use the List of Monuments, schools, street range databases etc. to get valid coordinates for a location
- Use update to get this info to the Trips tab. If the selected information has valid coordinate data the text will change from blue to black signifying a successful geocode
- Move to the next location to be coded using F8 and repeat procedure
- When all locations are coded conclude interview.

Reference Data Update Module (REF)

- Allows the geocoding supervisor to update the school and monument databases used in the DDE and GC.
- Connected to a map interface which allows the user to see the location of a newly added and coded location in space to avoid error.
- Used by coders to determine whether new schools and monuments that they have discovered have already been added to the pending database additions.

- The Reference Data Update is accessed by the links on the left hand side. These links are
 - 1. Search for schools and monuments
 - 2. Geocode Address
 - 3. View pending data on Map
 - 4. Add New School
 - 5. Add New Monument
 - 6. Manage School
 - 7. Manage monument
 - 8. (No link- Available for future development)
 - 9. Log Out

> 1. Search for Schools and Monuments.

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	6100	BRAMPTON FIRE AND EMERGENCY SERVICE		120 FERNFOREST DR BR			500438,4843603)	D	
	6103	QUALITY HOTEL AND CONFERNECE	CENTRE	5807 FERRY ST NIAGAR		-	555364,4772550)	G	
	6107	LAURA'S NO FRILLS		3445 FIELDGATE DR MIS		-	<u>513814,4831112)</u>	D	
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	6056	MICHAEL-ANGELOS		4099 ERIN MILLS PKY MIS		-	505934,4822850)	D	
	6059	TORONTO FIRE SERVICES - STATE		1 ESTHER SHINER BLVD			531166,4847430)	A	
							595856,4798280)	E	
	6069	BURLINGTON FIRE DEPARTMENT - STATION 1 (F	IRE HEADQUARTERS			-			
		BURLINGTON FIRE DEPARTMENT - STATION 1 (F 10 PINE DR	IRE HEADQUARTERS	10 PINE DR GUEL		-	560109,4823626)	M	

1. Search for Schools and Monuments

- Used to search the Production and Pending databases for schools and monuments
 - Production databases Those in use by the Interviewers and Geocoders
 - Pending databases Additional schools/monuments already discovered but not yet added to the Production databases
- Searches can be performed on any combination of information entered in the Name, Street Number, Street Name and Municipality textboxes
- The databases to be searched are selected from the checkboxes

> 1. Search for Schools and Monuments

Example of search using the Name and municipality fields

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S. <u>View Pending Data on Map</u> <u>Add New School</u> <u>5. Add New Monument</u> <u>6. Manage Schools</u> <u>7. Manage Monuments</u>	Bedition Nowned See Deads Edit Selected Monument Delete Selected Monument Version Name Address CSD Coordinates Survey Area No Records Found No Records Found	
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> 1. Search for Schools and Monuments

Example of search using the street name and municipality

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2. Geocode Address	STJOHN SEPARATE SCHOOL 2258 750 KINGSTON RD TORONTO TORONTO TORONTO (377734) A	
 View Pending Data on Map Add New School 	ST THERESA SHRINE CATHOLIC SCHOOL 1687 2665 KINGSTON RD TORONTO TORONTO (641564,4841794) A	
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8.	ST AUGUSTINES SEMINARY 9454 2661 KINGSTON RD TORONTO TORONTO (641544,4841769) A	
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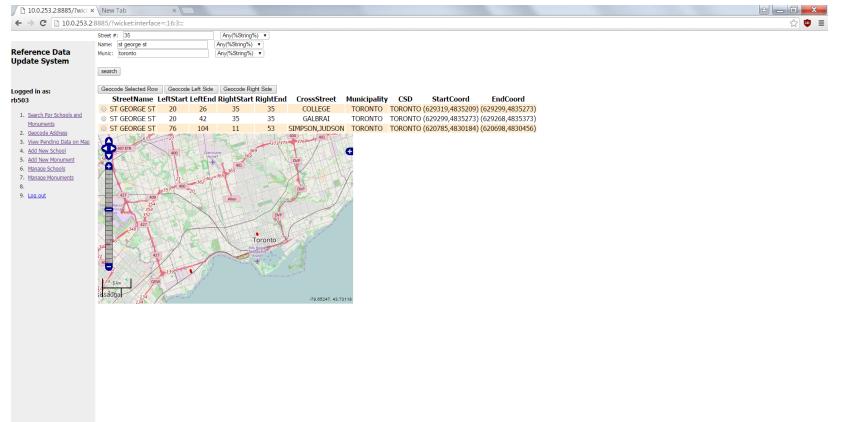
2. Geocode Address

- An address can be entered and if it has corresponding valid entries in the street network file these will be shown in the text as well as on the map.
- Useful in cases where a municipality has more than one street with the same name. The locations can be mapped to see which one makes sense before the coder enters the correct one in the Geocoding console.

2. Geocode Address

- Links along with the cross street and the street range and coordinates are listed in text and also displayed on the map.
- If one is highlighted then you can zoom in on that link
- Example shown for 35 St George St which has three possible valid links. (shown as red links on map)

2. Geocode Address



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- 3. View Pending Data on Map
 - Locations added to the Pending databases can be viewed on the map by the geocoding supervisor to determine their validity.

- 4. Add New School
 - The name and address location of the school are added and a list of geocoding links and a map are shown.
 - One link is selected and geocoded
 - New school should then be saved using the save button.
 - School is now saved in the Pending Schools database

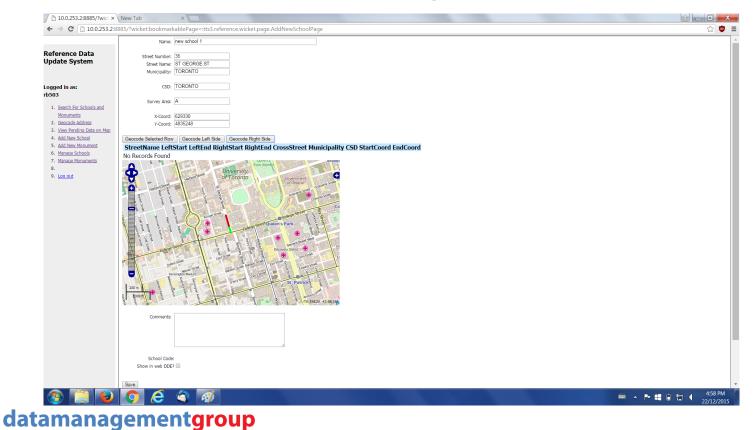
4. Add New School

 Add school info, select link(note no x-y coordinates yet until we geocode.

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4. Add New School

 After coding, coordinates and location are shown (selected location is the green link)



- 4. Add New Monument
 - Same as add new school except new location is saved in the Pending Monuments database.

5. Add New Monument

Add monument info: name, address info and select link(note no x-y coordinates yet until we geocode).

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Monuments		
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3. View Pending Data on Map	Y-Coord:	
4. Add New School		
5. Add New Monument	Geocode Selected Row Geocode Left Side Geocode Right Side	
6. <u>Manage Schools</u> 7. <u>Manage Monuments</u>	StreetName LeftStart LeftEnd RightStart RightEnd CrossStreet Municipality CSD StartCoord EndCoord	
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5. Add New Monument

After coding, coordinates and location are shown (selected location is the green link)



5. Add New Monument

 After saving monument information is now listed and a pointer shows its location coordinate.





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➢ 6, 7. Manage School, Manage Monuments

- After saving the new school or monument the Manage School/Monuments links allows the geocoder supervisor to view the details of the added schools or monuments
- The added locations can be edited or deleted as necessary
- Once it is determined that they are valid they can be selected and processed which initiates the move from the Pending to Production databases.

➢ 6, 7. Manage School, Manage Monuments

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