# ANALYSIS OF FOOD ESTABLISHMENTS WITHIN THE REGION OF WATERLOO

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## Introduction

The Region of Waterloo is an upper level municipality within South Western Ontario, Canada. The Region consists of the Cities of Kitchener, Cambridge, Waterloo and the townships of North Dumfries, Wellesley, Wilmot and Woolwich. Collectively, the Region has an estimated population of 540,000.

The Region has a very young demographic with an active food and restaurant scene. The population within the core cities is dominated by young university and college students and therefore a large proportion of the food establishments are focused around fast food and cheap eats, however a thriving tech industry has recently led to additional influx of more traditional and fine dine option.

## Problem Statement

With a growing list of food establishments catering to various demographics, this analysis of the food establishments is meant to gain insights into the following:

- Analyze all the food establishments to determine proportions of different types of restaurants within each municipality as well as the Region as a whole. This analysis would cater to food entrepreneurs looking to service a particular niche. This analysis also provides insight to consumers of available food choices.

- Compare the analyzed data to public health records maintained by the Region of Waterloo. The intent of this analysis would be to identify repeat offenders and/or to provide a general overview of health practices within the food establishment industry in the Region. This analysis will be taken further by clustering the food establishments and their public health trends to determine if there a particular geographic locales or type of establishments that are exceptional in their service offerings or prone to offenses. Not only is this data useful to end consumers to evaluate choices in food offerings, but also useful for public health officials to understand where to focus additional inspections.

## Data

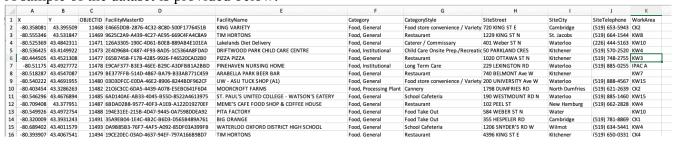### *Region of Waterloo – Food Inspection Facilities*

The Region maintains a list of all food inspection facilities within its municipal boundaries. This list is updated weekly and available to download in multiple formats or through a REST API.

The data is available for viewing or download here:
https://rowopendata-rmw.opendata.arcgis.com/datasets/food-inspection-facilities

This dataset contains a table with the following columns:
- **X, Y:** Geographical coodinates to locate the facility.
- **OBJECTID**: unique ID for the record
- **FacilityMasterID:** unique ID for each establishment. This ID links to other datasets also maintained by the Region.
- **FacilityName:** Business name
- **Category:** Categorical grouping to determine type of facility (institution facility, processing plant etc.)
- **CategoryStyle:** More detailed breakdown of the category (restaurant, butcher etc.)
- **SiteStreet:** Street Address of the facility
- **SiteCity:** Area Municipality of the facility within the Region
- **SiteTelephone:** Telephone number of the facility
- **WorkArea:** Code to reference service areas for the Region's inspections

A sample of the dataset is provided below:

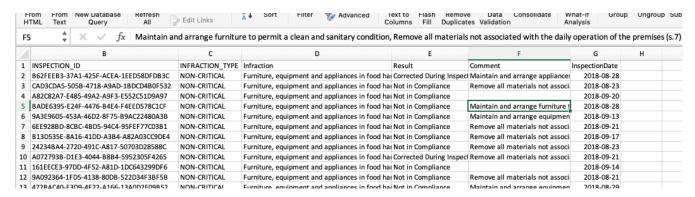| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | X | Y | OBJECTID | FacilityMasterID | FacilityName | Category | CategoryStyle | SiteStreet | SiteCity | SiteTelephone | WorkArea |
| 2 | -80.358081 | 43.395509 | 11468 | E4665DDB-2876-4C32-8C80-500F1776451B | KING VARIETY | Food, General | Food store convenience / Variety | 720 KING ST E | Cambridge | (519) 653-5943 | CK2 |
| 3 | -80.555346 | 43.531847 | 11469 | 9625C2A9-A439-4C27-AE95-669C4FA4C8A9 | TIM HORTONS | Food, General | Restaurant | 1229 KING ST N | St. Jacobs | (519) 664-1544 | KW8 |
| 4 | -80.525369 | 43.4842311 | 11471 | 126A3305-190C-4D61-B0E8-889AB4E101EA | Lakelands Diet Delivery | Food, General | Caterer / Commissary | 401 Weber ST N | Waterloo | (226) 444-5163 | KW10 |
| 5 | -80.536425 | 43.4149922 | 11473 | 2E4D9684-C487-4F93-8AD5-1C5364A8FDAD | DRIFTWOOD PARK CHILD CARE CENTRE | Food, Institutional | Child Care Onsite Prep./Recreatio | 50 PARKLAND CRES | Kitchener | (519) 570-2520 | KW4 |
| 6 | -80.444505 | 43.4521308 | 11477 | E65B7458-F178-4285-9926-F46520CAD2B0 | PIZZA PIZZA | Food, General | Restaurant | 1020 OTTAWA ST N | Kitchener | (519) 748-2755 | KW3 |
| 7 | -80.51175 | 43.4927772 | 11478 | E9CAF377-B3E3-46EE-B29C-A3DFBB1A2BBD | PINEHAVEN NURSING HOME | Food, Institutional | Long Term Care | 229 LEXINGTON RD | Waterloo | (519) 885-0255 | IPAC A |
| 8 | -80.518287 | 43.4547087 | 11479 | BE377FFB-514D-4867-BA79-B33AB771C459 | ARABELLA PARK BEER BAR | Food, General | Restaurant | 740 BELMONT Ave W | Kitchener | | KW7 |
| 9 | -80.540222 | 43.4691955 | 11480 | 03D3DFCC-E0DA-46E2-8906-8244BDF962CF | UW - ASU TUCK SHOP (A1) | Food, General | Food store convenience / Variety | 200 UNIVERSITY Ave W | Waterloo | (519) 888-4567 | KW15 |
| 10 | -80.403454 | 43.3286263 | 11482 | 21C6C3CC-6DA5-4439-A078-E5EBC641F6D4 | MOORCROFT FARMS | Food, Processing Plant | Cannery | 1798 DUMFRIES RD | North Dumfries | (519) 621-2639 | CK2 |
| 11 | -80.546296 | 43.4676894 | 11485 | 6AD140AE-AB33-4045-B55D-8522A4613975 | ST. PAUL'S UNITED COLLEGE - WATSON'S EATERY | Food, General | School Cafeteria | 190 WESTMOUNT RD N | Waterloo | (519) 885-1460 | KW15 |
| 12 | -80.709408 | 43.377951 | 11487 | 6BDAD2B8-9577-40F3-A1EB-A122D19270EF | MEME'S CAFE FOOD SHOP & COFFEE HOUSE | Food, General | Restaurant | 102 PEEL ST | New Hamburg | (519) 662-2828 | KW4 |
| 13 | -80.549926 | 43.4972754 | 11488 | 194E31EE-215B-4D47-9445-0A7598DDEA92 | PITA FACTORY | Food, General | Food Take Out | 584 WEBER ST N | Water | | KW10 |
| 14 | -80.320009 | 43.3931243 | 11491 | 35A9EB04-1E4C-4B2C-B6D3-D565B489A761 | BIG ORANGE | Food, General | Food Take Out | 355 HESPELER RD | Cambridge | (519) 781-8869 | CK1 |
| 15 | -80.689402 | 43.4011579 | 11493 | DA9B85B3-76F7-4AF5-A092-85DF03A399FB | WATERLOO OXFORD DISTRICT HIGH SCHOOL | Food, General | School Cafeteria | 1206 SNYDER'S RD W | Wilmot | (519) 634-5441 | KW4 |
| 16 | -80.393907 | 43.4067541 | 11494 | 19CE20EC-03AD-4637-94EF-797A166B98D7 | TIM HORTONS | Food. General | Restaurant | 4396 KING ST E | Kitchener | (519) 650-0331 | CK4 |

### *Region of Waterloo – Food Inspection Facilities Table*

As part of the data made available to the public, the Region provides a ZIP file archive with three CSV files:

- **Facilities_OpenData.csv**: This file has a list of names and addresses, and is akin to the table and listing provided in the data source above. Because this CSV file has fewer columns than the other data available above, we will largely ignore this CSV file.

- **Infractions_OpenData.csv:** This file provides a list of infractions observed by public health officials, either during their inspections or as a result of a public complaint registered on the Region's website. The columns available are as follows:

- o **INFRACTION_ID:** unique ID for the record
- o **INSPECTION_ID:** unique ID for the inspection
- o **INFRACTION_TYPE:** Identifies whether the infraction was listed as "Critical" or "Non-Critical"
- o **Infraction:** Identifies the actual infraction observed during the visit.
- o **Result:** Identifies whether the infraction was "Corrected during inspection" or "Not in Compliance"
- o **Comment:** Comments from the inspector with regard to the inspection
- o **InspectionDate:** Date when the inspection occurred

A sample of the dataset is provided below:



- **Inspections_OpenData.csv:** This file provides a list of inspections and their results. The columns available are as follows:

  - o **INSPECTION_ID:** unique ID for the inspection to relate it back to the Infractions_OpenData.csv
  - o **FACILITYID:** unique ID for the facility to relate it back to the facility listing
  - o **INSPECTION_DATE:** date for the inspection
  - o **REQUIRE_REINSPECTION:** a listing of 'Y' or 'N' to represent if a public health official is required to revisit the facility
  - o **CERTIFIED_FOOD_HANDLER:** 'YES' or 'NO' list. No further information is available with regards to what the column actually entails, however it is assumed that this is a list of whether the inspector met with an individual to be a Certified Food Handler.
  - o **INSPECTION_TYPE:** A list of whether the inspection was a result of a Complaint, a Compliance Inspection, Enforcement or a Re-Inspection

A sample of the dataset is provided below:

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | INSPECTION_ | FACILITYID | INSPECTION_ | REQUIRE_RE | CERTIFIED_F | INSPECTION_TYPE | | |
| 2 | 86BF1EB9-F( | 98312352-BE | 2019-07-24 | N | No | Compliance Inspection | | |
| 3 | 78D6795D-A! | 4AF8E99A-2: | 2019-08-21 | N | No | Re-inspection | | |
| 4 | CB8A02EC-4I | D4FF8AF3-0I | 2018-11-09 | N | No | Compliance Inspection | | |
| 5 | 90CB570C-48 | 3A7076E6-7( | 2019-01-16 | N | No | Re-inspection | | |
| 6 | AE6CB55D-F | F0C0D913-3' | 2019-09-25 | N | No | Compliance Inspection | | |
| 7 | 35711E5B-D: | 0770849D-48 | 2018-05-28 | N | Yes | Compliance Inspection | | |
| 8 | 869BA8CD-2! | F2089757-4E | 2019-11-21 | N | No | Compliance Inspection | | |
| 9 | C4C1F5B9-3E | 5F734A18-0: | 2018-10-18 | N | No | Compliance Inspection | | |
| 10 | 97175752-17 | 01CCA9D5-B | 2019-09-19 | N | No | Re-inspection | | |
| 11 | 726E271A-5/ | 5F26C369-B! | 2019-04-09 | N | No | Compliance Inspection | | |
| 12 | FFCA1F9A_D | D16770D7-1: | 2019-12-04 | N | No | Compliance Inspection | | |

The entire dataset is available here:
https://www.regionofwaterloo.ca/opendatadownloads/Inspections.zip

### FourSquare Places API

The FourSquare Places API will provide supplemental data to augment information from the Region of Waterloo Public Health. Specifically, the Venue Details endpoint will be utilized to obtain all available data on each venue of interest. Because this is a premium endpoint with usage limits, the list of interested venues will be filtered to specific points of interest which will be further defined as the analysis proceeds, simply to comply within the usage parameters. It is likely that the list will be pared down to facilities with a large number of critical infractions. The following data points will be used in the analysis:

- **id, name:** these will be obtained through the search for venues endpoint
- **stats:** to determine the number of checkins, user visits and number of tips to gauge popularity
- **price:** determine price point of the facility
- **rating:** determine the rating of the facility

Details and samples are available here:
https://developer.foursquare.com/docs/api-reference/venues/details