# National Geomatics Competition 2020:

# Bringing LRT to the City of Guelph

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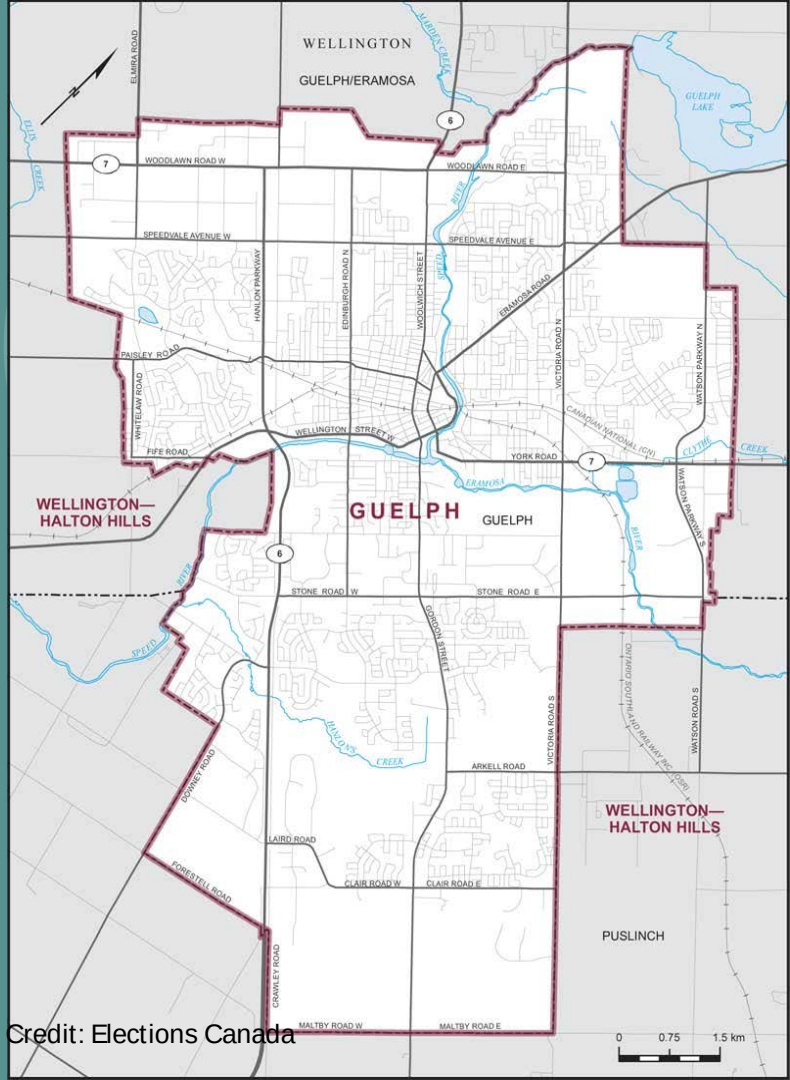



Credit: Elections Canada

# Procedure for Determining an Optimal Route

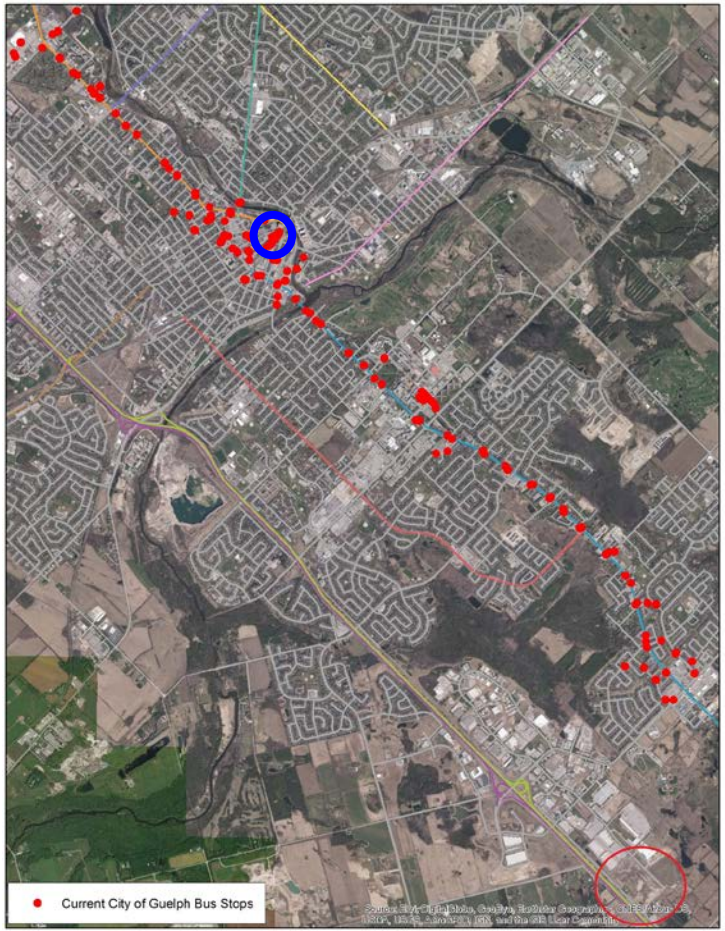
Network Analysis:

1. What criteria determine a good location?
    a. Road congestion, population density, proximity to key locations
2. How are candidate locations determined?
    a. GIS techniques: facility type weighting based on desirability
3. Who is the demand?
    a. City of Guelph and surrounding area (commuters, students)
4. What type of location-allocation model should be used?
    a. Maximize attendance: demand decreases in relation to distance

# Important Factors and Data Required

1. Population Density (Station Accessibility)
    a. Statistics Canada: 2016 Census, Guelph Ontario
        i. Population Age 15-64 years, Population and Dwelling Counts
    b. City of Guelph open data source: Street Network File
2. Proximity to Key Locations
    a. Current transit station, educational locations, emergency buildings, industry, major residential areas
3. Biophysical and Human Environmental Impacts
    a. Air and water (Speed and Eramosa rivers) quality impacts
    b. Traffic congestion during development
4. Road Classes, Land-use Class
    a. City of Guelph open data source: land parcels, road class
5. Current Transit Network
    a. City of Guelph open data source
6. Government Regulation (development allowances)

# Possible Routes for LRT

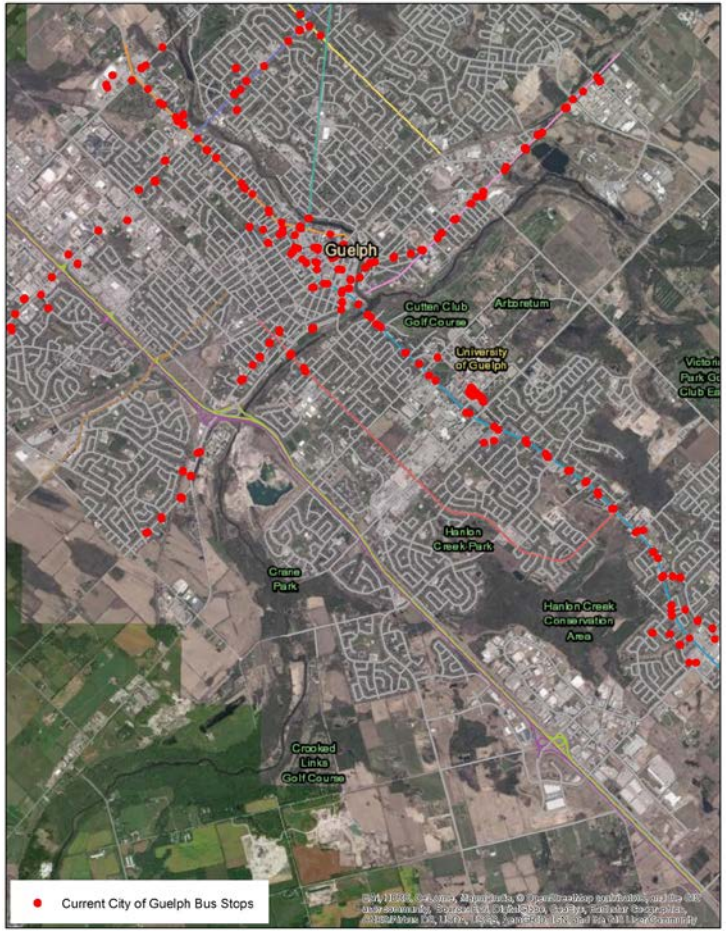



## Initial Development

1. Main Artery

## Long-term Development

1. Main Artery paired with offshoots



# Impacts and Vulnerabilities

1. Environmental Impacts
    a. Flooding zones
    b. Air and water quality
    c. Wildlife habitat degradation
2. Human Impacts
    a. Economic Growth
    b. Religious/Cultural Spaces
    c. Gentrification
3. Transportation/Infrastructure Impacts
    a. Concentrated Congestion
    b. Development of lanes, storage areas and stops
    c. Degradation overtime


Credit: Bill Thompson

# Procedure for Assessing Impacts and Vulnerabilities

1. Environmental Impacts
    a. Analyze flooding historical trends
    b. Monitoring precipitation, runoff, and river levels
    c. Identification of valued environmental components
        i. Water quality: TDS, pH, temperature, conductivity
        ii. Air quality: particulate matter, smog levels, greenhouse gases
2. Human Impacts
    a. Property and business values: compare to cities with LRT
    b. Holding community hearings, survey affected populations
    c. Public awareness and knowledge accessibility
3. Transportation/Infrastructure Impacts
    a. Site survey of sidewalk and road conditions/impacts of changes
    b. Overview of historical/current sewer paths
    c. Statistical analysis on current transportation use

# Procedure for Broader Long-Term Redevelopment

1. Road Networks:
    a. Repaving of roads, addressing past construction issues
2. Stop Locations:
    a. Usage of current bus stop locations
    b. Places of interest
    c. Improvement of sidewalks, promoting walkable cities
3. Storage and Repair Locations:
    a. Implement locations within industrial area
4. Place to Purchase Tickets:
    a. Presto Card, Retail locations (Shoppers Drug Mart, Grocery Stores)
5. Connecting and Expanding LRT
    a. Accessibility

# How Plan Relates to Sustainable Development Goals

1. LRT allows for easier transportation to U of Guelph, encouraging education
2. LRT allows for easier transportation to jobs, allowing for more people to work, reducing poverty and hunger, increasing health of residents
3. LRT creates less drivers, resulting in less consumption of gasoline and oil products, helping the climate
4. LRT is electrically powered and runs on clean energy
5. LRT creates a more inclusive and accessible city, reducing inequalities among residents

# Thank you!
# Questions?