

EX37.1.21

GEOGRAPHIC INFORMATION SYSTEM
FIRE SUPPRESSION
RESPONSE CAPABILITIES ANALYSIS



*International Association of Fire Fighters
1750 New York Avenue, N.W.
Washington, DC 20006*



TORONTO FIRE SERVICES
ONTARIO, CANADA

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City of Toronto Geographic Information System and Response Capabilities Analysis Summary

- Fire ground staffing refers to the **number and assembly of firefighters** at the scene
- The OFM model addresses the particular risk associated with a typical **single family, two story, detached dwelling**. However, the OFM recognizes total fire ground staffing for a municipality must reflect the individual community's circumstances and the types, age, size and distribution of risk. **Therefore the needs may vary from the minimal resources identified described by the OFM.**
- **NFPA 1710 is the consensus standard** for career firefighter deployment
- The fire department's fire suppression resources shall be deployed to provide for:

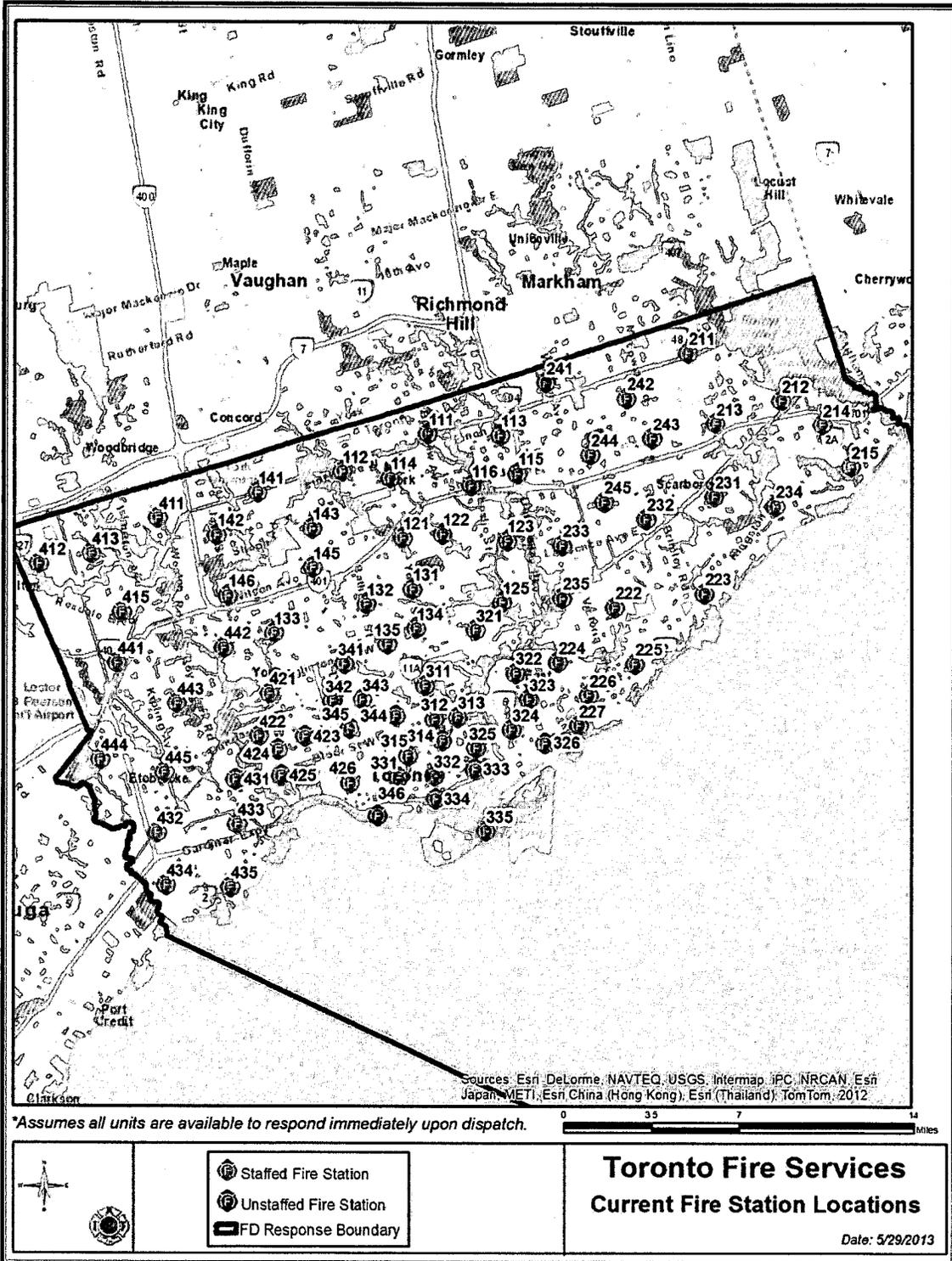
- The arrival of an engine (**Pumper**) company within a **240 sec (4min)** travel time to 90 percent of the incidents.
- The fire department shall have the capability to deploy an **initial full alarm assignment** within a **480 sec (8min)** travel time to 90 percent of the incidents.
- The Toronto Fire Services is **not currently in compliance** with performance objectives in NFPA Standard 1710.
- Some suppression companies (aerial, squad, and tower companies) **deploy with only 3 firefighters, out of compliance with industry standards.**
- Fire suppression **resources are not deployed adequately** for the arrival of a pumper company in 4-minutes and/or the arrival of an initial full alarm assignment within 8- minutes to 90 percent of all incidents.
- Therefore the City of Toronto Fire Services **does not meet the response time performance objectives outlined in NFPA 1710**, Standard for the Organization and Deployment of Fire Suppression Operations.

- Current resource deployment **does not comply** with travel time performance objectives included in the industry standard, which directs the assembly of **15 firefighters on-scene within 8-minutes** at 90% of all incidents.
- Fire Services is currently **unable to assemble personnel and apparatus resources required** to adequately address the unique fire protection and suppression problems related to **high-rise structure fire incidents**.
- The lack of resources, noted above, contributes significantly to **Toronto Fire Services' inability to accumulate the apparatus and personnel required** for even a typical full alarm assignment to 90% of all incidents within 480 seconds.
- At present, the Toronto Fire Services can only provide this level of service to addresses located on **78%** of the city's roads. This 78% coverage can only be achieved if all TFS apparatus are in service and fully staffed.
- **Any reduction in staffing or in service apparatus, temporarily or permanently, will further reduce this critical capability.**

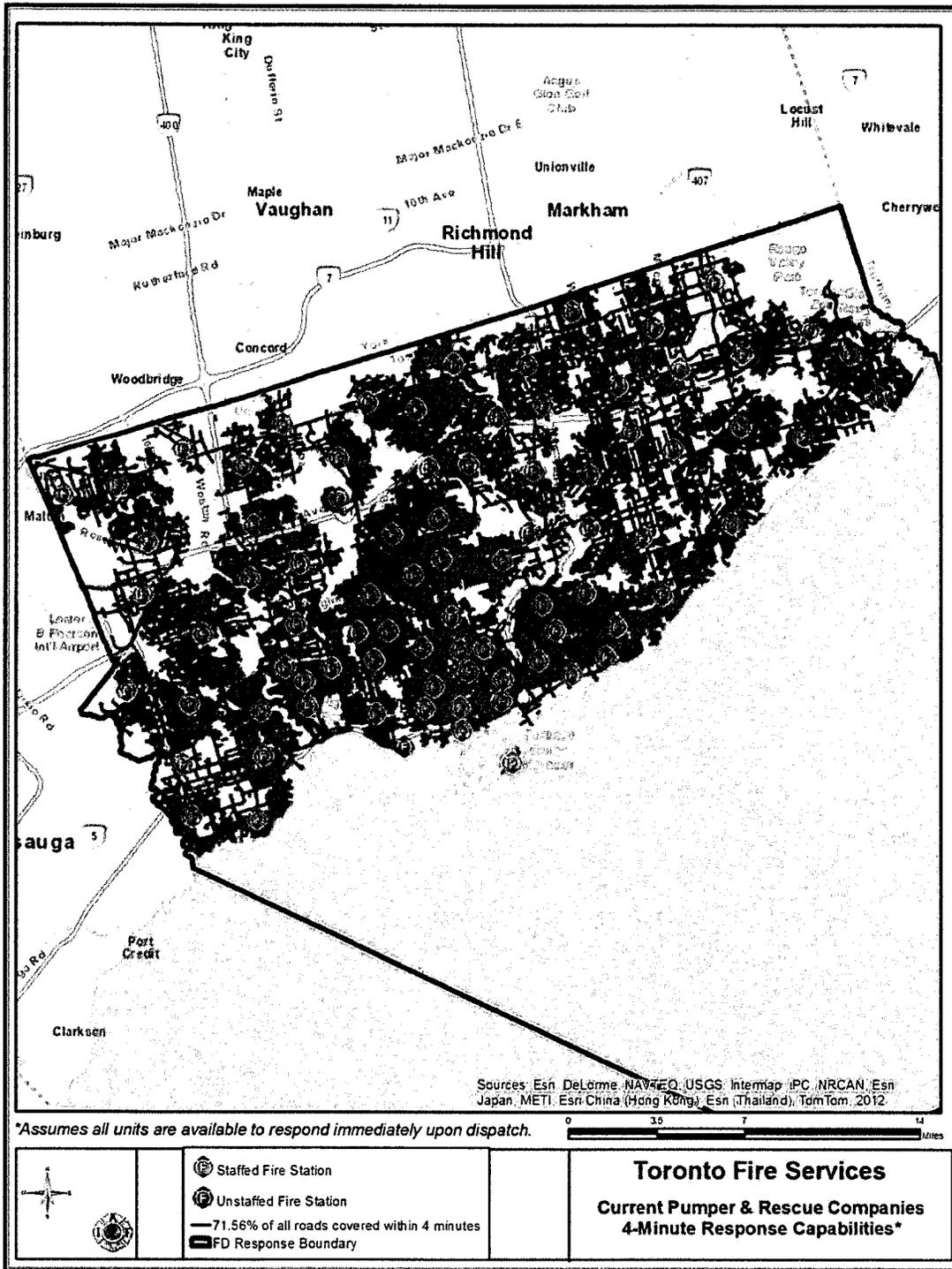
Recommendations

- The recommendations listed below are based on the findings of the GIS evaluation of both current and planned deployment models.
- All fire suppression apparatus (pumpers, ladders, aerials etc.) **should be staffed with a minimum of 4 firefighters at all times.**
- **Staffing to this level complies with industry standards** for crew size in a **low hazard residential environment** and reduces the risk to firefighters and trapped occupants in such an event.
- **Sending larger crew sizes** on a single apparatus allows crews to assemble on scene more quickly during early stages of a fire when **risks to both firefighters and building occupants are lower.**
- Since fire growth is exponential, growing in a non-linear manner over time, extending the time for crew assembly as a result of **waiting for smaller crews** to arrive from further away, **causes on scene risk to escalate.**
- The **higher the risks** at the time firefighters engage in fire suppression, **the greater the chance of poor outcomes** including civilian injury or death, fire fighter injury or death and property loss.

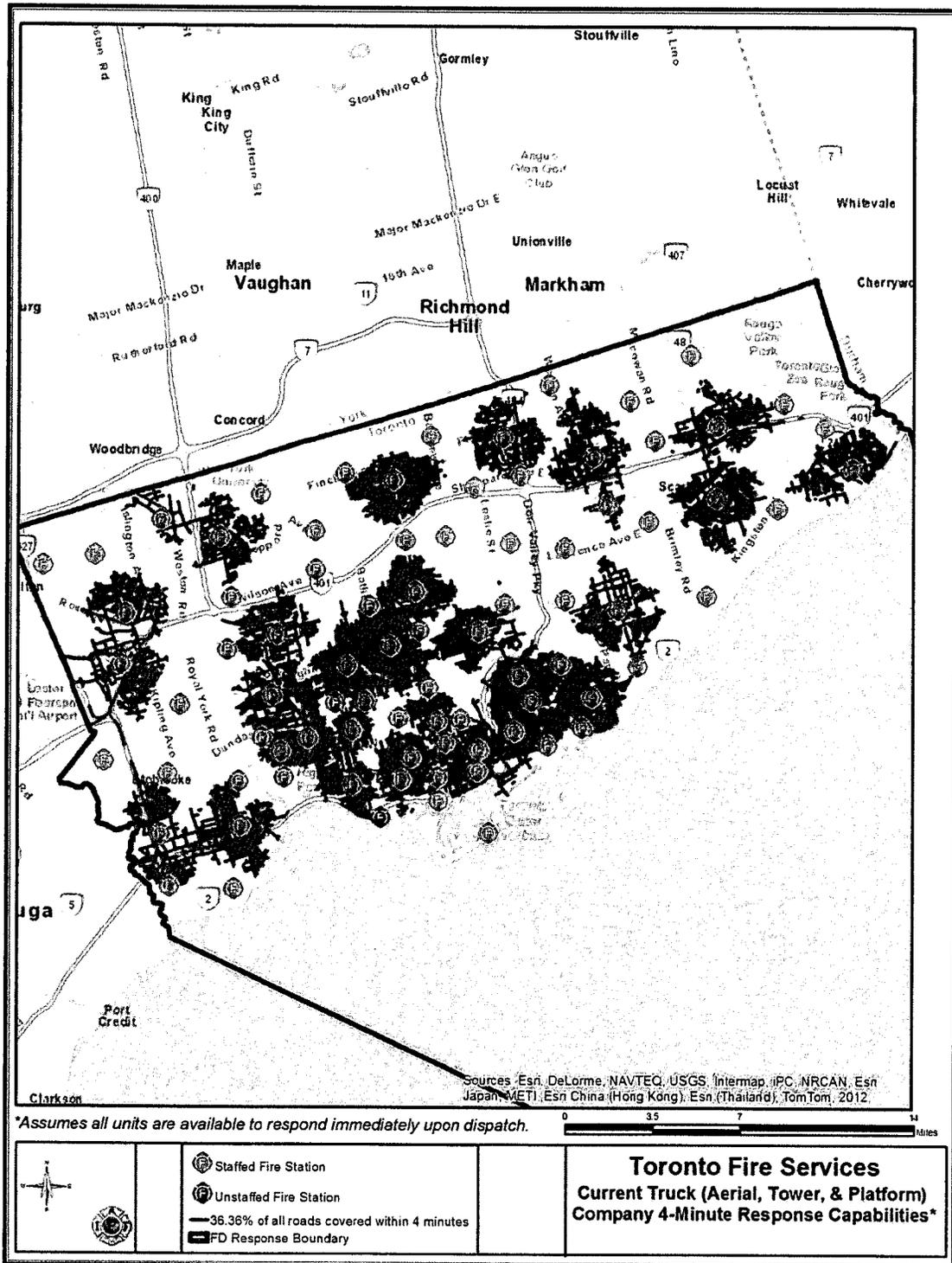
- **TFS should make every effort to maintain existing response capabilities** by at a minimum **keeping all existing fire apparatus in service** and available to respond to assemble in compliance with response time performance objectives outlined in NFPA 1710
- By **removing apparatus** and/or personnel, the City of Toronto will **lose fire and emergency medical service coverage** currently provided by Toronto Fire Services.
- People living or working in areas of the city where first due pumpers require **greater than 4 minutes** travel time to arrive on scene and engage in fire suppression or EMS activities are **more vulnerable to negative outcomes** from fire, illness or injury.
- Additional Aerial apparatus staffed with a **minimum of 4 firefighters** should be considered.



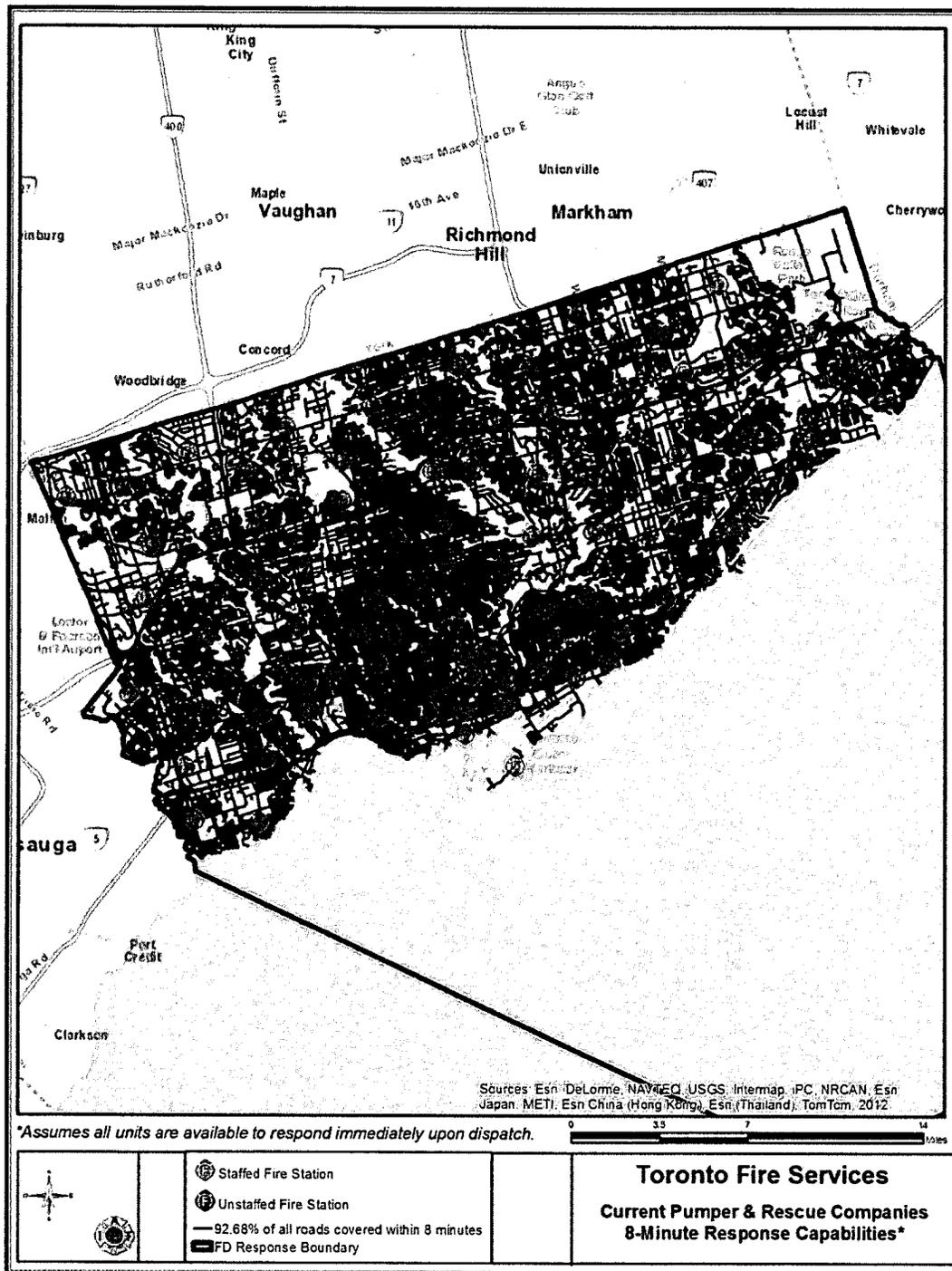
Map 4 shows the Toronto Fire Services response boundary, existing fire stations, and other locations of public interest such as major roads and highways, and waterways.



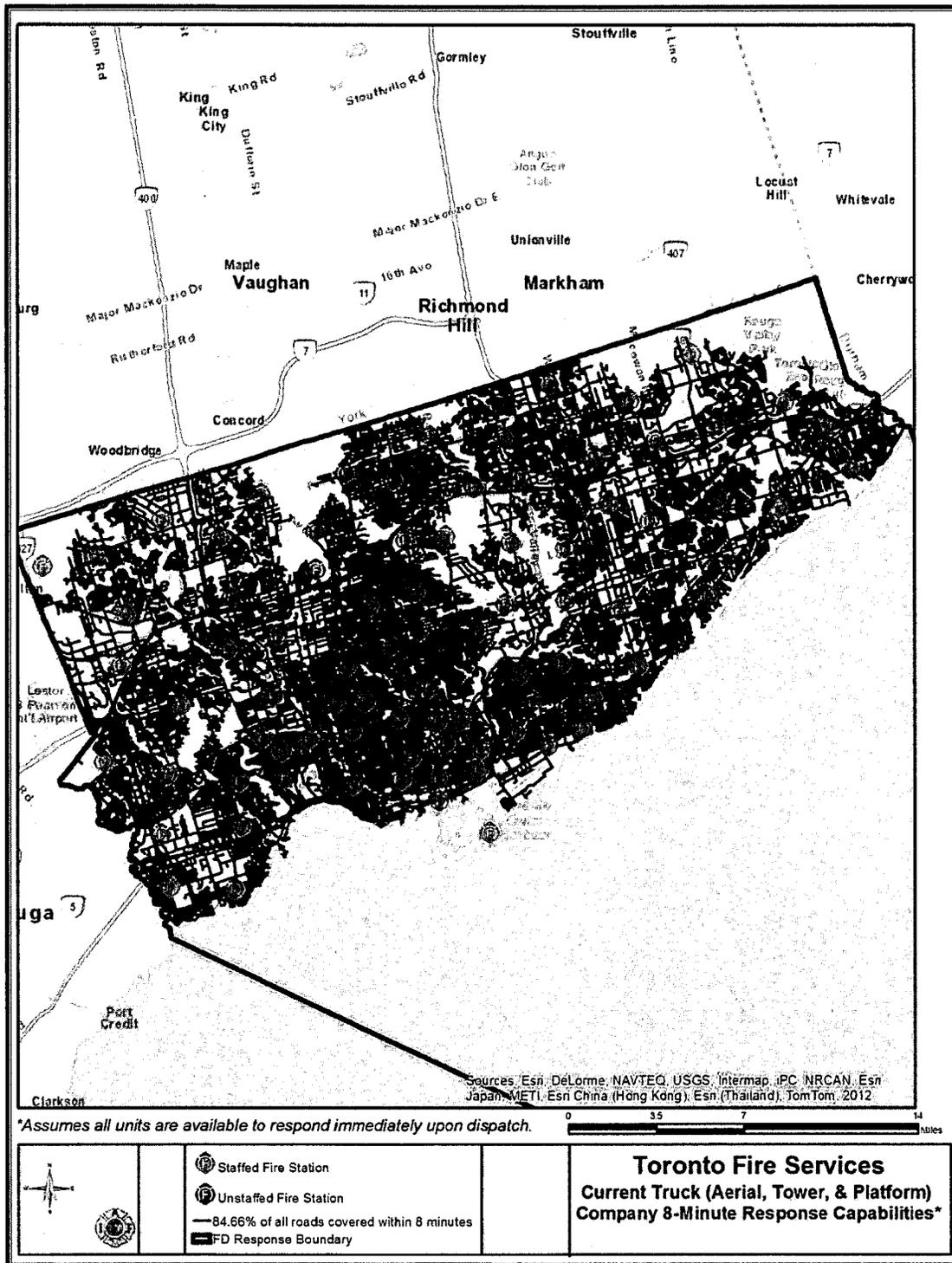
Map 8 indicates the existing staffed Pumper & Rescue Company 4-minute response capabilities. The green colored roads are covered within 4 minutes. Currently, the staffed Pumper Companies are capable of responding to **71.56% of all roads located within the Toronto Fire Services Response Area within 4 minutes**, assuming units are available to respond immediately upon dispatch.



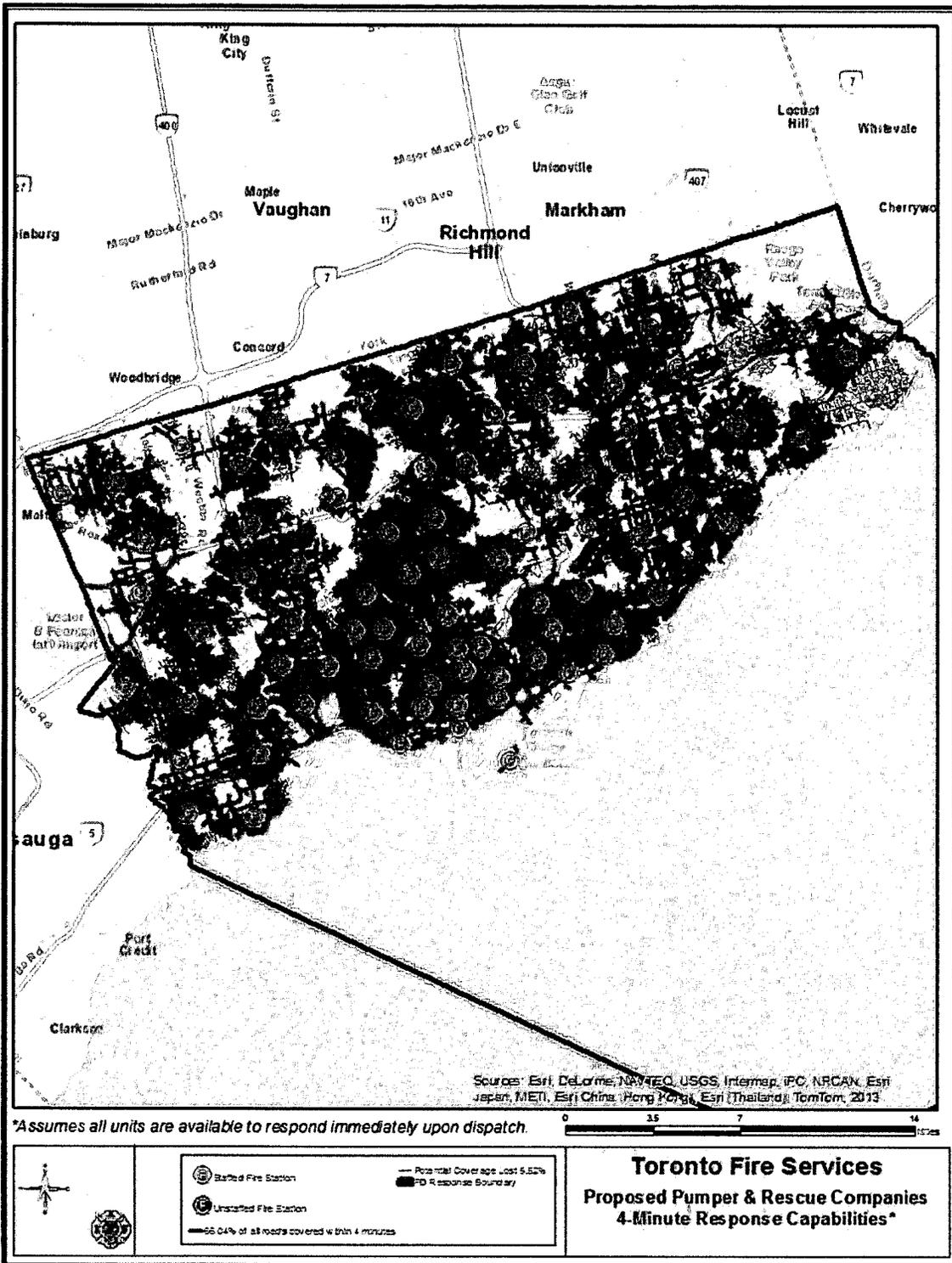
Map 12 indicates the existing Aerial (Ladder) Company 4-minute response capabilities. The green colored roads are covered within 4 minutes. Currently, the Aerial Companies are capable of responding to 36.36% of all roads within the Toronto Response Area in 4 minutes or less, assuming all units are available to respond immediately upon dispatch.

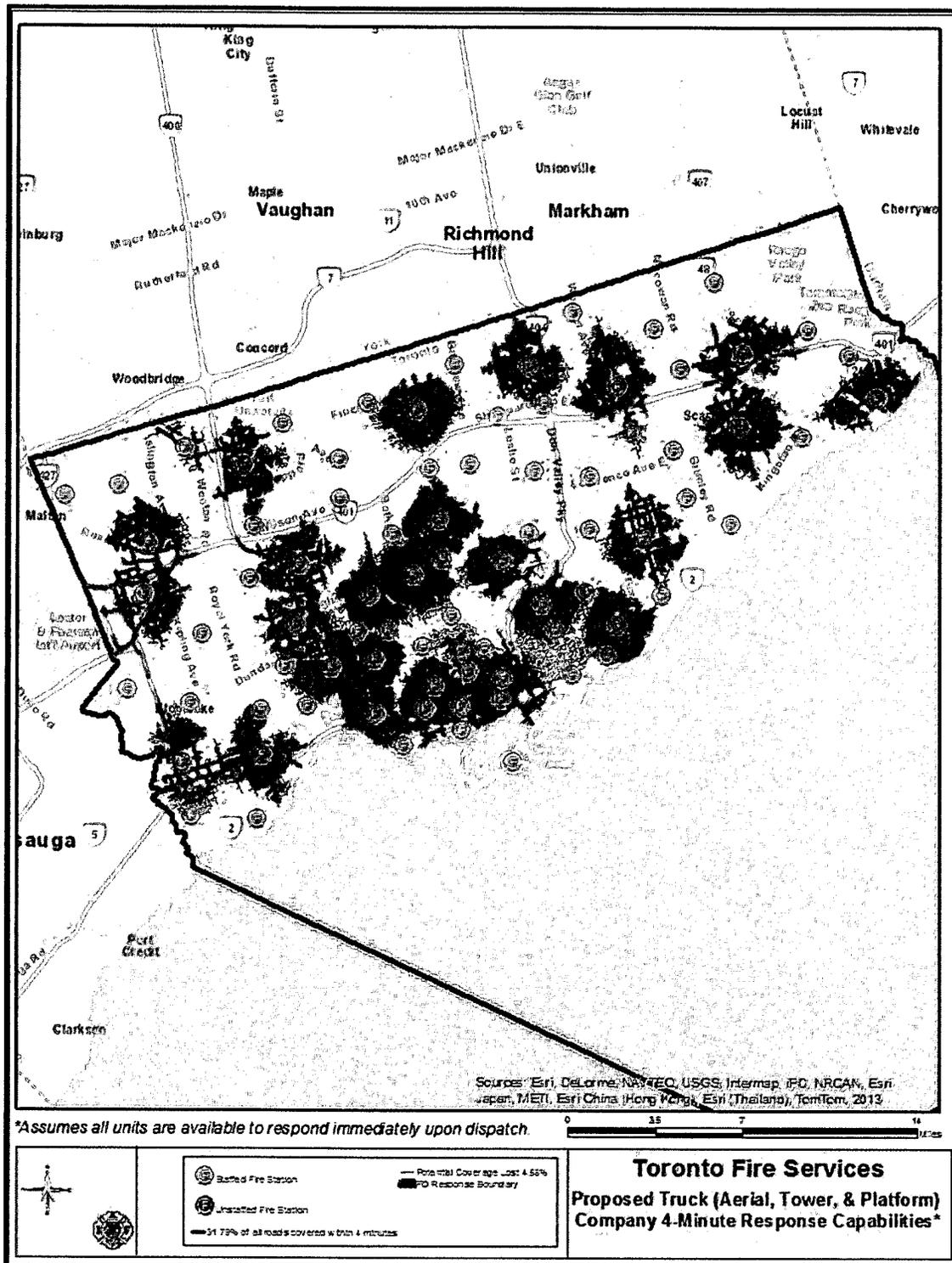


Map 9 indicates the existing 8-minute response areas for pumper & rescue companies responding from existing fire stations, staffed on a 24/7 basis with career firefighters. The blue colored roads are covered within 8 minutes. Currently, the Pumper & Rescue Companies that deploy from fire stations are capable of responding to **92.68% of all roads located within the Toronto Fire Services Response Area in 8 minutes or less, assuming all staffed units are available to respond immediately upon dispatch.**

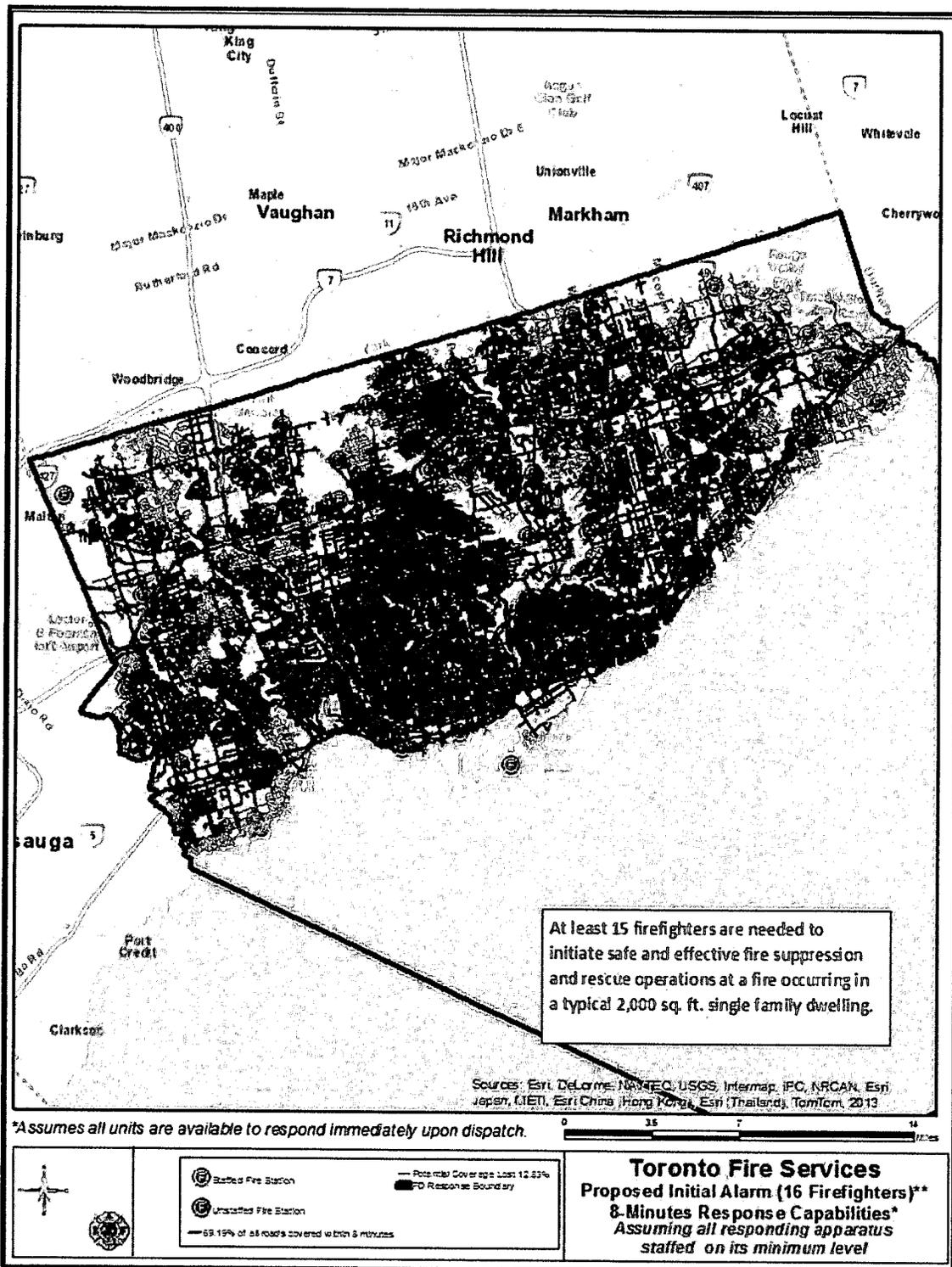


Map 13 indicates the existing Aerial (Ladder) Company 8-minute response capabilities. The blue colored roads are covered within 8 minutes. Currently, the Aerial (Ladder) Companies are capable of responding to **84.66% of all roads within the Toronto Response Area in 8 minutes or less, assuming all units are available to respond immediately upon dispatch.**





Map 29 indicates the anticipated Toronto Fire Services' Ladder Truck (Aerial, Tower, Platform) Companies 4-minute response capabilities pursuant to the implementation of recently proposed apparatus staffing and deployment adjustments. The GIS software calculates the Toronto Fire



Map 33 indicates the anticipated 8-minute NFPA 1710 “Initial Full Alarm”, sixteen fire fighter, response capabilities pursuant to the implementation of the recommended staffing and deployment adjustments, assuming all apparatus are staffed with at assigned minimums. The

GIS software calculates the Toronto Fire Services would have this level of response capability on 69.19% of all roads (colored blue) within 8 minutes. **The fire department will have the capability to respond with sixteen firefighters to 69.19% of all roads within 8 minutes,** pursuant to the implementation of the proposed changes, **which translates to a 12.83% decrease in response capabilities from the existing conditions,** *assuming all apparatus are staffed at minimums and available to respond immediately upon dispatch.*