



5 May 2022

Re: Agenda Item DI20.6: Automated Micro-Utility Devices – Accessibility Feedback

Dear Members of the Toronto Accessibility Advisory Committee (TAAC),

My company, Quantum Robotic Systems (QRS), is a robotics startup based in Toronto (in East York, in fact). I am providing this submission to urge you to reconsider your opposition to the Automated Micro-Utility Device (MUD) pilot project.

Some background:

- QRS makes mobile service robots that are designed to help people carry things.
- Our **Robotic Stairclimbing Assistant (ROSA)**, in particular, was developed to help seniors and people with mobility issues overcome barriers posed by stairs.
- In general, our robots are **assistive devices** that are designed to **improve accessibility**.
- Our robots are meant to operate primarily indoors but may on occasion require access to public right-of-ways (ROWs), e.g., carrying groceries in from a parked vehicle to someone's front door.
- We were a participant in the recent **Transportation Innovation Challenge (TIC)** showcasing MUDs.

In December 2022, our robots, like all others, were banned by City Council. This ban was based almost entirely on a recommendation from TAAC to the Infrastructure and Environment Committee (IEC). However, TACC's recommendation was seriously flawed for many reasons:

- Its fundamental premise that "robots are unsafe" is not supported by actual evidence.
- Similarly, the claim that "not enough is known about MUDs" is false because there is plenty of data available about devices that are already in service on public ROWs in other cities.
- Stakeholders from the robotics community, who might have easily addressed safety questions or uncertainties about MUDs, were not consulted.
- Rather than drawing upon expert opinion, TAAC relied almost entirely on the opinions and far-fetched scenarios advanced by one advocacy group.
- The recommendation ignored the fact that other jurisdictions, including many other cities committed to Vision Zero, have successfully established regulatory frameworks to allow robots to operate on ROWs.

Perhaps the most serious flaw is the fact that TAAC's recommendation effectively denies an entire class of **accessibility-enhancing technology** from the very constituents it purports to represent. Robots have been safely carrying groceries, clearing snow, expediting sidewalk repair, and delivering food and medicine for years in other cities. Why then is TAAC blocking these benefits here in Toronto?

Thank you for considering my detailed submission (see **attached**).

Sincerely,

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QUANTUM ROBOTIC SYSTEMS

A Submission to the Toronto Accessibility Advisory Committee (TAAC)

Dr. Frank Naccarato
President & Founder of Quantum Robotic Systems Inc.
5 May 2022

Purpose of This Submission

In December, Toronto City Council voted 'no' to participating in the Automated Micro-Utility Device (MUD) pilot project proposed by the provincial government. Moreover, Council voted to ban all robots from City right-of-ways (ROWs), i.e., sidewalks, bicycle lanes, park paths, etc.

This ban was based almost entirely on a recommendation from TAAC to the Infrastructure and Environment Committee (IEC). At the time, QRS and many others argued that a ban was a short-sighted overreaction to a non-existent problem. Moreover, the basis for the recommendation and the process by which it was reached were seriously flawed.

The objectives of this submission are twofold:

- To correct the record by refuting many of the arguments on which the ban was based
- To urge TAAC to withdraw its objections so that Toronto can participate in the MUD pilot

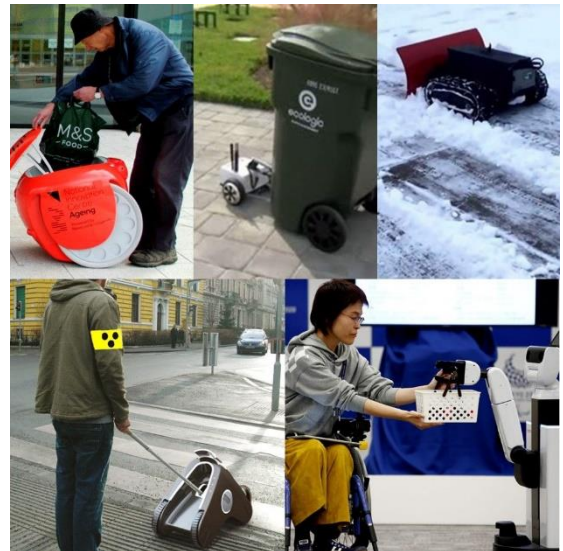
Robots Actually Improve Accessibility

Ironically, one of the main arguments put forward to ban robots is that “robots reduce accessibility.”

This is plainly not true.

Robots at their core are **assistive devices**. Here are just a few examples of how existing robots improve accessibility:

- Robots that help seniors and people with limited mobility carry groceries, bins, or packages.
- Snow-clearing robots for mobility-challenged homeowners.
- Inspection robots that expedite sidewalk repair.
- Robots that bring trash and recycling bins to the curb.
- Guide robots for the visually impaired.
- Robots that deliver meals and medicine.



In Toronto especially, delayed snow removal and poor sidewalk conditions are major barriers to accessibility. Why then dismiss technology that can help the very people TAAC represents?

“Robots are Unsafe”

Not true.

The evidence suggests that robots operating on public ROWs are quite safe.

- Starship, a world leader in delivery robot, has completed over 2 million delivery trips
- Tiny Mile, a Toronto-based robot delivery company, has compiled 100,000 km worth of data
- In all these trips, there have been no reports of serious injuries

One incident that is often touted as proof that robots are obstacles for people with disabilities involves a student at Pittsburg University that was reported trapped on a busy street by a robot that refused to get out of her way. However, videos of the incident refute that account.

Mobile robots that interact with people are equipped with sensors that stop the machine if an obstacle is detected. Also, most robots operating on public ROWs are not completely autonomous. They are equipped with cameras with a human operator at the other end. These operators have the ability to stop the robot and steer around obstacles.

“Sidewalks are for Pedestrians”

Not really.

Sidewalks already have many existing potential obstacles for people with disabilities. This is an unfortunate fact of urban life. Here are just a few examples:

- baby strollers
- trash cans
- benches
- planters
- dogs on leashes
- restaurant patios
- delivery carts
- shopping buggies
- signs
- parking meters
- bike racks
- fruit stands
- snowbanks
- etc., etc., etc.



Ironically, **mobility scooters** can be quite hazardous. Bylaws are required to designate mobility scooters as “pedestrians” to allow them to operate on sidewalks lawfully, despite the fact that they account for numerous accidents each year.

To pretend that small robots are existential threats that would suddenly tip the City into chaos is disingenuous.

BTW: Robots can be equipped with **flashing lights** and **beepers** to alert people with disabilities of their presence... something a planter or snowbank can’t do.

“We Don’t Know Enough About Robots”

Only if you willfully ignore the facts.

Actually, we already know quite a lot about robots. They’ve been around for a long time. Mobile robots operate every day in countless warehouses, factories and hospitals – all crowded with people, all without incident.

Safety standards dictating how these robots interact with humans have been in place for years. More are being developed right now, specifically for robots in urban settings.

“Robots on Public ROWs are Unproven”

False.

MUDs are not new, scary, unproven tech just out of the lab. There are an estimated 50+ cities with prior experience with service robots operating on public ROWs. Over a dozen jurisdictions in the US have developed legal frameworks to allow and regulate robots (some are designating them as pedestrians, like mobility scooters).

Robots are **not** incompatible with safety. Other major **Vision Zero** cities with comparable or higher densities than Toronto (including London, Seattle, Berlin, Stockholm and San Francisco) already allow and regulate robots on sidewalks.

Other Canadian municipalities have embraced technology such as snow-clearing and sidewalk inspection robots. Toronto, however, lags behind.

Other Far-Fetched Reasons for Banning Robots

- *“They will steal personal information with their cameras”* – Toronto should then be prepared to ban cellphones for the same reason.
- *“Limiting their size and speed won’t help”* – You don’t have to be an engineer to see why this is false.
- *“You can’t tell who’s operating them”* – Why not? Cars, taxis, motorcycles, trucks, etc., are all registered. They have legally required ID tags (e.g., license plates). If someone decides to operate an unregistered robot, by all means fine them, just as you would someone who operates a car without a license.
- *“You won’t know who to sue”* – Really?
- *“You can’t tell what’s inside”* – The same is true for car trunks, purses, knapsacks, grocery bags, Amazon boxes, baby strollers, etc., etc., etc.
- *“They can be used as terrorist weapons”* – See the last point.

In Summary

What does a robot ban say about Toronto’s commitment to innovation? What does it say to startups struggling to get a foothold in the market, who could really use the support of their home town?

There are plenty of evidence-based reasons to support the idea of allowing mobile service robots on public ROWs in Toronto. We just have to be forward-thinking enough to realize that it is possible to have a safe city that also embraces new ideas.