



Welcome to the tenth workshop on METR. Today we will talk about multimodal and micromobility operations.

Agenda

- Overview
- Multimodal and Micromobility
 - Sidewalk and Kerbside Operations
 - Public Transport Notices
 - Kerbside Interfaces
 - Disability Needs
 - Sidewalk Automation Notices
- Next Steps

The topics today are listed on this slide

Acknowledgements

Small group has started structuring the problem

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Standards Process

- ISO/TC 204/WG 19
 - Drafting Team

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It is important to acknowledge that the materials developed to date represents a team effort. While there is a core editing group, as shown in the upper left, the concepts presented within this presentation already reflect valuable inputs from the review team shown on the right. In addition, the overall document is being prepared under the auspices of ISO/TC 204/WG 19, and especially its METR Drafting Team.

Ground Rules

- METR is very complex and involves many disciplines
- Workshops are based on this structure and designed to receive feedback
- If you have comments, please voice your concerns
 - Verbally (and concisely) during discussion slides (marked with  icon)
 - Using chat window
 - Using discussion forum (<https://github.com/ISO-TC204/iso24315p1/discussions>)

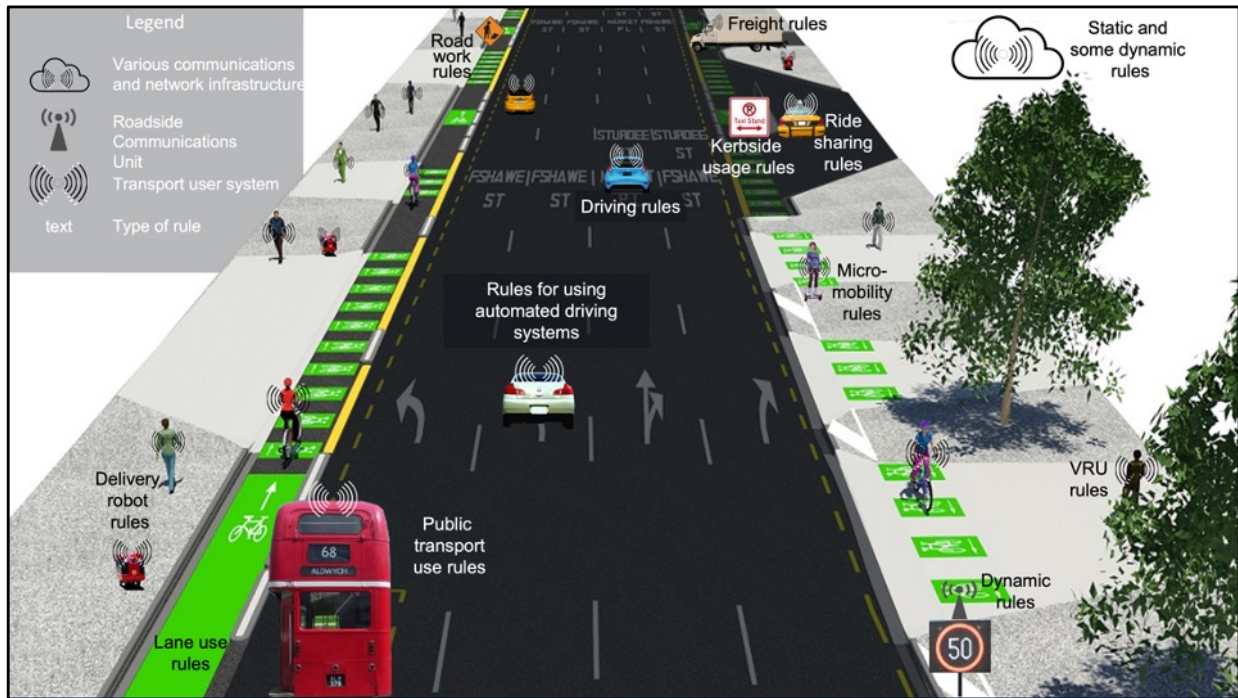
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Before we begin, it is useful for everyone to understand the ground rules of our conversation. The development of the ConOps is intended to be a cooperative effort that reflects the input from stakeholders from different perspectives. To facilitate this process, the development team has prepared the workshops to gain feedback from stakeholders – but your feedback does not have to be limited to the topics presented.

The workshops are generally structured to present a topic and then gain feedback. Participants are welcome to voice their concerns during the workshop presentations, either verbally or using the chat window, but we request that verbal feedback is made when we are on discussion slides. We also recognize that our workshops are time limited and comments should be kept fairly concise. If major topics of discussion arise we can schedule additional meetings to focus on specific points, as needed. We have also established a discussion forum on the Github site to promote off-line conversations and encourage everyone to use the facility,

After we complete the workshops, we expect to prepare a draft ConOps early next year, and there will be ample opportunity for additional comments on the document once distributed.



METR is intended to support all transport user systems. This includes: vehicle systems (e.g., automated driving systems and driver support systems), sidewalk delivery robots, and other devices such as smartphones used by pedestrians and perhaps units on-board micromobility devices (e.g., e-scooter interfaces)

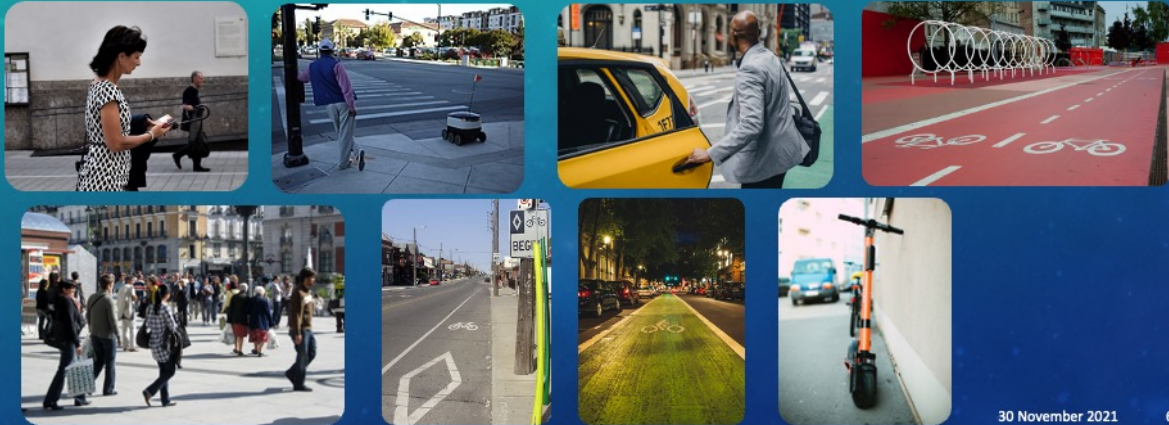
The information provided to these users would potentially include all rules related to using the transport facilities, such as (from top and proceeding clockwise) any special rules for freight delivery or for the operation of heavy vehicles, kerbside usage rules (e.g., bus stop, taxi stand), ride sharing rules (e.g., what forms of ride sharing are allowed), micromobility rules (e.g., are e-scooters allowed in cycle lanes), VRU rules (e.g., is the sidewalk closed to pedestrians), dynamic rules (e.g., variable speed limits, lane control signals), public transport use rules (e.g., does my ticket qualify me for a transfer, what are the fare zones), lane use rules (e.g., bike only, bus only, HOV-2), delivery robot rules (e.g., what is the maximum speed for a delivery robot for this sidewalk), road work rules (e.g., speed limit for the work zone). METR is intended to be flexible enough to address all of the transport rules, these are just a few examples that demonstrate the breadth of the effort.

Importantly, in order to cover all rules, the scope must include rules that can change

or be imposed in a dynamic fashion. For example, temporary lane closures due to unplanned incidents and signal timing information need to be considered and handled in a trustworthy way, even when long-range communications may not be available. Thus, the full scope of METR will likely need to rely on both cloud based delivery mechanisms as well as local broadcast of exceptional data.

Sidewalks and Kerbside

- What types of rules does METR need to convey related to sidewalk, pedestrian plaza, and kerbside operations? For example, does METR need to include rules for pedestrians?



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Our first question today, what do users of the sidewalk environment need from METR. In particular, do pedestrians need to have access to any information (e.g., on their smartphones) or do we think this is unnecessary.

Pedestrian - <https://images.unsplash.com/photo-1597177574273-b391da2b9b25>

Pedestrian Plaza - https://c1.staticflickr.com/3/2468/4072267091_6882e0cc6f_b.jpg

Man and bot -

https://upload.wikimedia.org/wikipedia/commons/thumb/6/6b/Man_and_delivery_robot_waiting_at_pedestrian_crossing_in_Redwood_City%2C_California.jpg/220px-Man_and_delivery_robot_waiting_at_pedestrian_crossing_in_Redwood_City%2C_California.jpg

Man and delivery robot waiting at pedestrian crossing in Redwood City, California.jpg

Taxicab - <https://www.pexels.com/photo/faceless-black-man-opening-taxi-door-on-busy-street-5648413/>

E-scooter - <https://images.pexels.com/photos/3671151/pexels-photo-3671151.jpeg?auto=compress&cs=tinysrgb&dpr=2&h=650&w=940>

Basic Bike Lane -

https://commons.wikimedia.org/wiki/File:Rogers_Road_Bike_Lane.jpg

Green bike lane - <https://images.pexels.com/photos/3256031/pexels-photo-3256031.jpeg?auto=compress&cs=tinysrgb&dpr=2&h=650&w=940>

Red bike lane -

https://upload.wikimedia.org/wikipedia/commons/e/e7/Red_bikeway_in_Copenhagen%2C_Denmark.jpg

Rules for Public Transport

- To what extent does METR need to convey additional regulated (allowed) uses of public transport facilities? For example, does it need to distinguish between a bus lane that can only be used by city buses versus one that can be used by city, charter, and other buses?



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In relation to public transport, what types of rules does METR need to distribute? Does it need to distinguish exactly what is meant by a “bus lane” (e.g., what types of buses are allowed)

Charter Bus -

[https://upload.wikimedia.org/wikipedia/commons/thumb/4/46/Passengers_exiting_a_Michaud_charter_bus%2C_circa_1970.jpg/1280px-](https://upload.wikimedia.org/wikipedia/commons/thumb/4/46/Passengers_exiting_a_Michaud_charter_bus%2C_circa_1970.jpg/1280px-Passengers_exiting_a_Michaud_charter_bus%2C_circa_1970.jpg)

[Passengers_exiting_a_Michaud_charter_bus%2C_circa_1970.jpg](https://upload.wikimedia.org/wikipedia/commons/thumb/4/46/Passengers_exiting_a_Michaud_charter_bus%2C_circa_1970.jpg/1280px-Passengers_exiting_a_Michaud_charter_bus%2C_circa_1970.jpg)

Blocked Bus Lane - <http://www.streetsblog.org/wp-content/uploads/2016/11/bus-lane-fail.jpg>

Big Bus - https://live.staticflickr.com/2922/34000474355_3b0b095071_n.jpg

Kerbside Interfaces

- Who needs information on kerbside rules and when? For example, do service providers and users need to be able to dynamically discover local rules especially when not in their usual jurisdiction?



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Our next topic relates to kerbside rules. What information do users need to properly operate vehicles next to the kerbside? Who needs these rules?

Rubbish bins - <https://bugwoodcloud.org/images/1536x1024/5493634.jpg>

Car/Hydrant - <https://www.flickr.com/photos/elyaqim/11411879293/>

Load Only - https://www.flickr.com/photos/sdot_photos/25357601701/

Air Port Dropoff -

<https://www.flickr.com/photos/daviderickson/2593436903/in/photostream/>

Slug Lane - https://upload.wikimedia.org/wikipedia/commons/d/d3/Slug_Line.gif

App Ride User - <https://images.pexels.com/photos/1386649/pexels-photo-1386649.jpeg?auto=compress&cs=tinysrgb&fit=crop&h=627&w=1200>

App Ride Stop - https://travelshopgirl.com/wp-content/uploads/2017/04/image_2017-04-29-113131-0000_11-1024x768.jpg

Van Pool -

<https://localwiki.org/media/cache/94/71/94710c960f754fa6e1f4f80865fba19a.png>

Taxi Passenger - <https://images.pexels.com/photos/6280698/pexels-photo-6280698.jpeg?auto=compress&cs=tinysrgb&dpr=2&h=650&w=940>

Disability Needs

- What specific capabilities/information are needed within METR to accommodate travellers with disabilities? For example, should METR provide guidance for locating accessibility ramps?



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What are we missing so far in relation to specific categories of users? For example, are there additional rules that people with disabilities need to be aware of? For example, does METR need to indicate the position of accessibility features (ramps, loading zones)? Are there other needs to be considered?

Accessibility sign:

https://upload.wikimedia.org/wikipedia/commons/thumb/d/d0/Wheelchair_ramp_sign.jpg/1200px-Wheelchair_ramp_sign.jpg

Wheelchair accessible parking area:

https://upload.wikimedia.org/wikipedia/commons/thumb/5/51/Somewhat_Makeshift_Disability_Access_Ramps.jpg/800px-Somewhat_Makeshift_Disability_Access_Ramps.jpg

Wheelchair on bus -

<https://www.flickr.com/photos/metrolibraryarchive/7298606182/in/photostream/>

Sidewalk Automation Notices

- What METR information needs to be conveyed to VRUs/VRVs about the allowed operation of AVs, especially footway delivery drones?



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And what about sidewalk delivery robots. While these devices are just starting to emerge in the environment, it is expected that they will begin to become much more prevalent. What information do they need to operate and to what extent does METR need to alert other users that these types of devices are present?

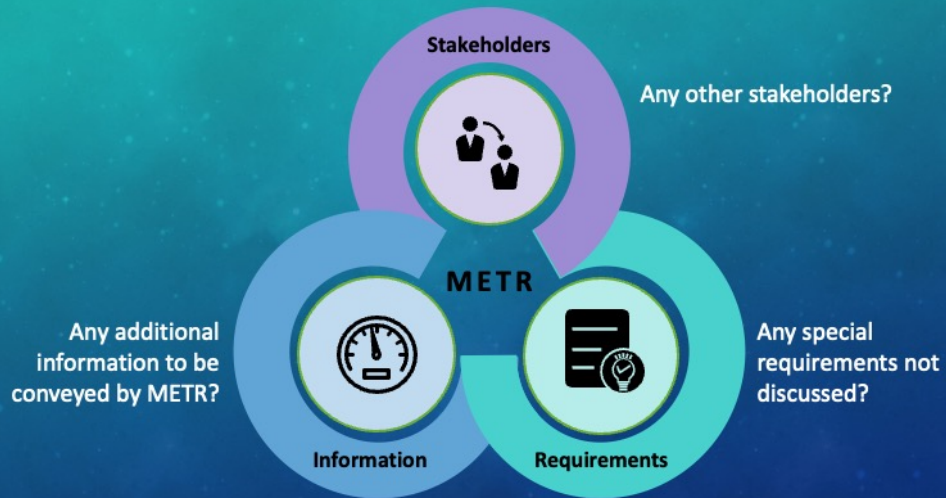
Robo Dog - <https://www.bostondynamics.com/sites/default/files/2021-02/spot-explorer-web-2.png>

Man & bot -

https://upload.wikimedia.org/wikipedia/commons/thumb/6/6b/Man_and_delivery_robot_waiting_at_pedestrian_crossing_in_Redwood_City%2C_California.jpg/220px-Man_and_delivery_robot_waiting_at_pedestrian_crossing_in_Redwood_City%2C_California.jpg

Bot in crosswalk - <https://www.flickr.com/photos/joewarminsky/33858357395/>

General Questions



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Finally, as a sanity check, are there other types of users or stakeholders that we need to be talking with? Are there other needs that we need to consider?



That concludes the meat of Workshop 10

Workshop Schedule

Date	Topic
28 September	METR operations
5 October	METR operational structure
12 October	Electronic regulation life cycle
19 October	Electronic regulation conflicts
26 October	Vehicle operations
2 November	Vehicle information needs
9 November	Campus governance
16 November	Campus regulations
23 November	Roadwork and emergency operations
30 November	Multimodal and micromobility operations
7 December	METR deployment: Part 1
14 December	METR deployment: Part 2

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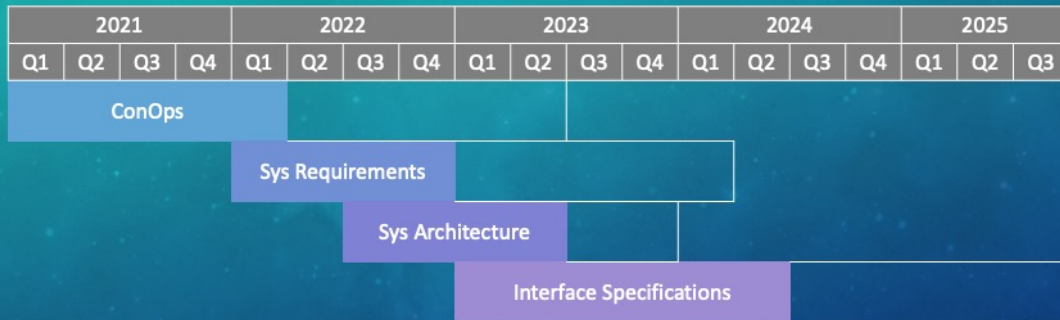
We've now completed 10 of our 12 workshops. Our next workshop will focus on deployment

Workshop 11 Topics

- METR Deployment: Part 1
 - Prerequisites
 - Authorization and Revocation
 - Conformance and Maturity Capabilities
 - Regulatory Structure
 - METR Availability, Performance, and Accuracy
 - Non-repudiation
 - Management, Control, and Maintenance
 - Funding

The next workshop will focus on the topics shown on this slide

Tentative Schedule



- End of task shown at expected committee draft
- Transparent bar shows standards review and approval process
- System architecture is expected to be online only (i.e., it will use a shorter review process)
- Interface specification are expected to enhance existing standards

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As a reminder our current expected timeline is shown here. We hope to have a ConOps draft in early 2022, whereupon it will start the standardization process (of multiple reviews prior to standardization)

More Information

More information and a discussion forum is available at:

<https://iso-tc204.github.io/iso24315p1>



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More information about the project and the latest developments will be posted on our GitHub site. This will include a PDF of weekly presentation files to be posted after our meetings each week.

https://upload.wikimedia.org/wikipedia/commons/thumb/2/24/Cartoon_Guy_In_Deep_Thought_Using_A_Computer.svg/1200px-Cartoon_Guy_In_Deep_Thought_Using_A_Computer.svg.png