Blue text indicates revisions to vision based on meeting discussions
Red text indicates items that need more discussion

Source	Slide	Topic	Summary Points of Discussion
W1	9	Connectivity	Road vehicles should support short-range wireless; not necessarily true for other transport user systems
W1	9	Connectivity	Some users might not be connected to METR
W1	9	Connectivity	All ~mobile~ METR-enabled transport user systems should support mobile wireless internet
W1	9	Connectivity	Mobile wireless internet is not guaranteed for any location
W1	9	Connectivity	Mobile wireless internet might not be available (at any time) for some locations
W1	9	Connectivity	METR should support user systems that might not be mobile. For example, a home PC used for planning a journey and understanding the rules when travelling in other areas
W1	9	Connectivity	Users have a need to indicate their preferred internet connectivity mechanism, but user systems must always stay up-to-date per agreements with disseminator
W1	9	Connectivity	User systems might support the ability to download rules in advance of a long journey
W1	9	Connectivity	METR should support ordinary traffic (i.e., driver support systems)
W1	9	Connectivity	METR should cover the full scope of surface transport (e.g., ITS)
W1	9	Connectivity	Need to support rules related to specific types of users (e.g., accessible parking permits/placards) in a manner that allows integration with the user system
W1	14	Trustworthiness	Trustworthiness should include non-repudiation under accountability
W1	17	Roles	METR should indicate the level of legal precedence that the electronic rules have (e.g., compared to physical traffic control devices)
W1	17	Roles	Users should have a way to report discrepancies between electronic rules and physically observed rules (and this should be shown on diagram)
W1	17	Roles	We should emphasize that the types of regulators and translators shown in Slide 17 are just examples
W1	17	Roles	Some regions might wish to have a system manager to manage portions of METR
W1	17	Roles	Should provide sample diagrams showing implementations of the role-based architecture; multiple examples will be needed to prevent implying that there is a preferred approach
W1	17	Roles	The role model should add a role between the regulator and the translator that represents the "competent authority". In other words, the regulator might define a regulation, but the "competent authority" is responsible for implementing the regulation where it can then be translated.
W1	17	Roles	The ConOps should provide practical use cases that explain the varied types of rules that might be disseminated and how the process would work
W1	17	Roles	The ConOps needs to identify accountability needs that demonstrate that each METR component is fulfilling its responsibilities (e.g., non-repudiation that its responsibilities were completed at each point in time)
W1	21	Modes	The concept of modes does not seem to apply to our collaborative system of systems

Source	Slide	Topic	Summary Points of Discussion
W1	21	Modes	State of the transport network needs to be conveyed through the state of each rule (see Workshop 3, i.e., use of C-ITS data)
W1	21	Modes	State of rule availability should be captured using a catalogue for each provisioning system
W1	21	Modes	The ConOps should reference ISO/IEC/IEEE 15288 and indicate which type of "system of systems" best describes METR
W1	21	Modes	All rules should be defined in a language-neutral format
W1	30	Push/Pull	METR should be based on a centralized pull of static data coupled with dynamic data being provided by a combination of (1) provisioning from a central system and (2) pushing/broadcasting from local source(s)
W1	30	Push/Pull	It should be the responsibility of the user system to pull data when needed (e.g., periodically and when entering new area)
W1	31	Push/Pull	Each METR rule (e.g., give way to emergency vehicles) needs to support being associated with conditional logic such that the rule is only active when the condition is true. The conditional logic might need to reference external variables (e.g., "it is snowing", "workers are present", "children are present", "it is after dusk"), which might be provided by a METR system component or another source (e.g., C-ITS data, vehicle sensor array, etc.).
W1	32	Push/Pull	Withdrawn/rescinded rules need to be publicized in a fashion similar to publicizing new rules (i.e., static when possible, dynamic otherwise)
W1	32	Push/Pull	METR will rely upon existing standards when appropriate
W1	32	Push/Pull	User systems need high confidence that they have all active rules
W1	32	Push/Pull	Development team needs to contact field crew stakeholders to determine if they have concerns about the work flow changes being proposed (e.g., ensuring that electronic rules are activated simultaneously with field deployment of rules)
W1	33	Push/Pull	Use of push should be minimized while still providing a high certainty of delivery for ~all~ vehicles entering the area of applicability (e.g., even those that just turned on and are entering the roadway); otherwise communication channels are easily overloaded.
W1	33	Push/Pull	Push is probably needed for coordination of installation of signs
W1	33	Push/Pull	Hierarchy of rules should support the concept of default speed limits that can be overridden by local speed limits (and similar local override concepts)
W1	34	Push/Pull	Pull process must support filtering
W1	34	Push/Pull	Centralized dynamic rules either need true broadcast (e.g., broadcast over a metropolitan area) or needs to support filtering (e.g., publication/subscription rather than broadcast, or pull at more frequent rates than for static data)
W1	34	Push/Pull	Filtering should include almost all parameters that can be identified, including: vehicle classification, user classification (e.g., driver's license type, police officer), road classification, location, type of rule, temporal constraints, nature of load, possession of a permit (e.g., parking), vehicle characteristics (e.g., mass), etc.
W1	34	Push/Pull	There is a lack of consistent terminology and meanings within rules. What exactly does "stop" mean, what are differences between zones, areas, etc.
W2	12	Roles	The definition of a "regulator" needs to be flexible enough that a regulator can enter data in an electronic format (i.e., also perform the role of translator)

Source	Slide	Topic	Summary Points of Discussion
W2	12	Roles	ConOps should explain that all components will need to be certified into the trust domain and jurisdictions might require additional certifications.
W2	14	Roles	The ConOps needs to assign the responsibility to perform consistency checks to one (or more) of the roles. (probably the disseminator and regulator and perhaps supplemented by others). Resolving consistency checks will likely involve coordination of regulators.
W2	17	Roles	The preferred implementation is that the regulator also performs the role of translator during the creation of the rule. This allows the most timely digitization of the rule and the greatest opportunity to publicize the rule prior to its activation.
W2	17	Roles	The preferred implementation is that a user relies on a single disseminator; this will simplify processing and minimize the potential for conflicting rules being received by the user. However, jurisdictions might require use of a specific disseminator for some functions (e.g., freight management operations) while a vehicle uses a different disseminator for more general purposes. Finally, all users will need to be able to supplement their METR data with C-ITS data (e.g., locally broadcast data). The multiple sources of data will require additional consistency checks by the ITS user system.
W2	19	Roles	Peer roles need the ability to coordinate to ensure that they have consistent data.
	19	Roles	METR must provide accountability such that the source of any inconsistency can be identified
W2	21	Roles	Disseminators need to be able to share cross-boarder information and allow for discovery via a defined service (e.g., national access point)
W2	22	Roles	A mobile refresh provider should be characterized as a mobile disseminator as it will need to fulfil the responsibilities of a disseminator rather than a user
W2	22	Filters	Need to be able to filter rules based on location (e.g., GIS based distribution services)
W2	23	Discrepancies	The feedback loop needs to include the regulator (and competent authority) in case the physical signage is in error
W2	23	Data Distribution	The ConOps should be written in a generic enough fashion to not prohibit the use of mainstream data distribution technologies.
W2	23	Discovery	The ConOps should mention that automated discovery is a likely possibility but explain that there does not appear to be a pressing need to standardize the interface or requirements.
W2	23	Data Sources	METR should distinguish between "rules" and "C-ITS data" that is used to support rules. METR disseminators are responsible for distributing rules; C-ITS data is provided by a "C-ITS data provider" role.
W2	23	Data Sources	To the extent that C-ITS data is exchanged electronically; it should be provided in an open manner (e.g., broadcast to all for no charge)
W2	26	Catalogue	There needs to be a fifth catalogue state, which is a rule that is electronically available but references details that are not electronic. For example, a postal vehicle might be exempted from some parking/stopping rules but the parking rule likely does not specify that exemption directly

Source	Slide	Topic	Summary Points of Discussion
W2	27	Terminology	Validity should apply to rules; we need another term to describe the required refresh period of downloaded catalogues (e.g., expiry period)
W2	32	Privacy	User privacy needs to be protected, especially for the data requests that are submitted
W2	32	Case Study	Australia will be issuing a report soon that describes high priority categories of rules
W2	33	White Paper	Need examples that can be presented to government managers and used to sell METR; this should probably be documented in a white paper rather than the standard so that it will remain freely available
W2	32	Roles	The disseminator is responsible for ensuring that all rules meeting a user's criteria are delivered to that user
W2	23	Data Sources	Users need a way to discover disseminators using an ITS service (external to METR)
W2	11	Roles	When showing multiplicity in diagrams other than UML, use "n" rather than "*" to prevent confusion with the concept of "all"
W2	26	Filters	METR filtering needs to accommodate the possibility that some users might qualify as different types of vehicles for different jurisdictions (e.g., a national "moped" and a local "scooter")
W3	11	Rule types	Remove the rule types from the state machine diagram; if the diagram needs to show specializations for the different types, break the diagram into a separate diagram for each specialization so that each conforms to UML rules.
W3	11	Rule types	When discussing rule types, we need to consider the terminology and perhaps adopt the terminology used by DATEX II (rules issued by 1) competent authorities, 2) ad-hoc, 3) planned dynamic, and 4) authorized actors). After further review, we propose: "unposted rules": not posted with traffic control devices and fully publicized in advance of activation "persistent rules": traffic control devices that are deployed without any expectation of a termination and fully publicized in advance of activation "temporary rules": traffic control devices that are deployed with an expectation of a future termination and fully publicized in advance of activation "ad-hoc rules": rules that are implemented prior to the expiration period of previously downloaded rule sets (i.e., not fully publicized in advance of activation); these rules must be distributed via C-ITS. An example is a police officer on scene directing traffic or imposing a road closure "state-triggers": Events that affect the practical impacts of a rule for a user (e.g., state of a traffic signal, current value of a variable speed limit, rain causing the activation of a slower speed limit rule, etc.) These require either on-board sensors or C-ITS data from outside sources to implement. Within our definitions we should attempt to capture any synonyms used by different regions of the world for particular terms
W3	22	Rule types	When discussing planned rules, indicate that they may require authorization, which might be a period for months, even though the actual implementation of the rule may just be a for a few days

Source	Slide	Topic	Summary Points of Discussion
W3	29	Trustworthiness	User requests should be confidential and privacy aspects should be disclosed (i.e., allow alternate uses only when disseminator discloses such use and allows user to opt in)
W3	30	Filters	See slide for examples of filters that need to be considered
W3	31	Filters	METR should allow filters and rules to be stated in both positive and negative fashion (e.g., "only trucks" or "except trucks")
W3	32	Evacuation plans	Evacuation plans should be distributed in advance to the extent possible when the threat provides little advance notice and might disable disseminator channels (e.g., an earthquake). However, plans will often need to be updated to reflect real-time conditions (e.g., blocked roadway); so there is a need to support high availability during these events and to support dynamic updates (e.g., C-ITS notice that an update is available and all users need to download)
W3	29	Responsibilities	The disseminator is responsible for publicising the filters/categories of data that it has available and the expiry period for each rule set delivered
W3	29	Responsibilities	The user is responsible for requesting a refresh of all rules that the user needs prior to their expiration
W3	29	Responsibilities	All roles are responsible for 1) identifying conflicts and inconsistencies among rules, 2) correcting the conflict/inconsistency, if the issue is due to an error on its part, and 3) notifying the source(s) of the rules of the identified
W3	8	Roles	The term "C-ITS data source" should perhaps be revised to be more consistent with other role names. For example, perhaps "C-ITS data provider". We should also be clear that the C-ITS data provider likely supports services external to METR (i.e., it is cooperative)
W3	8	Roles	The ConOps should describe why we are distinguishing between the disseminator and the C-ITS data provider. This is partially due to the fact that we want to emphasize the different roles (e.g., push vs pull) and the fact that some C-ITS data might come from other sources (e.g., on-board clock, rain sensors, weather service, etc)
W3	10	Lifecycle	The ConOps should provide a brief mention that proposals can have review periods and that new proposals can be initiated to refine existing rules
W3	10	Characteristics	The ConOps should explain that rules might be deployed for a test user community or a specific testing location. This is likely more of a rule characteristic rather than a unique operational state of a rule.
W3	8	Roles	What is the legal standing of C-ITS data. We should probably have a discussion in the ConOps that discusses the legal aspects and explain that it is likely to vary by jurisdiction and might need the ability for METR to convey whether particular C-ITS data providers are "official"
W3	11	Rule types	The ConOps should explain that the rule types have their own aspect of hierarchy. In other words, all rules start with legislative action that enact laws. Some laws will empower road authorities to define persistent traffic rules using traffic control devices. Other rules empower road operators, police, etc to impose temporary rules (e.g., road work rules), ad-hoc rules (e.g., snow chain requirements), and to distribute C-ITS data (e.g., SPaT and variable speed limits) to activate/update state-triggered rules.

Source	Slide	Topic	Summary Points of Discussion
W3	18	Use cases	The ConOps should include a use case that explains the process for installing and removing a permanent traffic control device (e.g., a parking sign) and explain how the process needs to work in real time to ensure consistency in information, especially when a traffic control device installation does not occur on schedule and the system needs to flag the discrepancy. And also perhaps for what happens with a missing device (e.g., missing speed limit sign as approaching or leaving a town on a rural highway)
W3	25	Use cases	The ConOps should also include a use case for emergency response deploying traffic control device to make a crash site safe
W3	29	Responsibilities	The "when" responsibility should apply to all roles, not just users
W3	29	Responsibilities	We need to indicate that each system needs to support non-repudiation to show what it knew when while also documenting the constraints applicable to the component as to how much storage might be available. We need to be able to indicate what sort of time limit the non-repudiation needs to be available for. We also need to determine if the level of non-repudiation needed requires a bi-directional confirmation (i.e., return receipt) or unidirectional (i.e., self reporting that information was received)
W3	29	Responsibilities	Clarify text of responsibilities (as shown on slide) that the users are responsible for requesting and processing the applicable rules that are available from the disseminator (they cannot be held responsible for rules that the disseminator fails to provide)
W3	31	Filters	Some conditions might require OBE inputs (e.g., sensor, clock data) or C-ITS data (e.g., SPaT/MAP) and in some cases the data could be from either (e.g., is it raining). Rules might need to indicate the source for official definition of the state of a rule (e.g., "when raining" is based on NWS; "holidays" are based on calendar from X).