



Request for Proposals
Blockchain Challenge

Ministry of Infrastructure and Water Management, MaaS programme

Version 1.0

9 September 2019

1. MaaS in the Netherlands

The Ministry of Infrastructure and Water Management in the Netherlands procured a framework agreement with the intent to launch seven national MaaS pilots that can be scaled to a national level. After almost two years of preparations and consultations, the framework agreement attracted 41 consortia of which 24 were eventually awarded a contract. In this framework a standardized approach has been developed based on the Industrial Data Space, with the ambition to set up a (inter)national MaaS ecosystem that can be sustainable for all stakeholders. The goal of the MaaS project is that passengers will plan, book and pay for their journey digitally in the future, with for all means of transport. For example, the shared car, bicycle, (water) taxi, bus, metro and train.

To gain insight into the functioning and the effects of MaaS, the seven pilots have been chosen so that they can be rolled out nationally. Experiences are gained with transport companies, market parties and governments. The pilots will start in the regions: Amsterdam, Utrecht-Leidsche Rijn, Twente, Rotterdam-The Hague (including Rotterdam The Haque Airport), Eindhoven, Groningen-Drenthe and Limburg.

The Ministry of Infrastructure and Water Management was pleased with the high level of interest in the Framework Agreement for pilots, it gave a lot of confidence that we are on the right track. Many parties in the consortia have platforms or apps at their disposal; however, not all parties in the Framework Agreement will be able to win a pilot. The Ministry hopes that everyone's input could be used to further develop standardization and the MaaS ecosystem, and one point of interest is to see to what extent Framework Agreement parties that do not win a pilot can also quickly get started with MaaS.

The successful introduction of MaaS also requires corresponding policies that can relate, for example, to unexpected external effects of internet platforms, vertically-integrated transport providers (including platforms), data sharing, a level-playing field and policy measures regarding parking and sharing concepts. The Ministry will be working with the 7 regions on this in the coming months.

The Ministry of Infrastructure and Water Management is receiving more and more signals that the selected approach to MaaS is seen as a promising one, also internationally. In the Netherlands, the government has increasingly fulfilled its role as an orchestrator, for example because it turned out that cooperation between transport operators and MaaS service providers would otherwise be difficult to start with. This role is in line with the needs that the parties expressed

The main purpose of the pilots is to learn. It is expected that during the course of the pilots more insights will be gained into what a suitable form of governance is for the MaaS ecosystem. If the conceptual promises of MaaS are fulfilled in practice, there will be many opportunities for more data-driven mobility policy, more efficient utilization and the achievement of other policy goals, such as those concerning target group-oriented transport. At this stage, however, the Ministry fully acknowledges that these are pilots and, in pilots, things may also go wrong in order to learn from them. This concerns the emergence of a new platform economy, as platforms can lead to (positive and negative) effects. The MaaS program will monitor the situation and impacts closely.

2. Goal of the Blockchain Challenge

As learning by doing is clearly a central goal in the MaaS pilots of the Ministry, this philosophy is extended to other fields that will relate to MaaS implementation in the future. Blockchain may be one of the potential disrupting technologies that can contribute to the successful (future) operation of a MaaS ecosystem. Especially for those functions which require trust to be established in transactions between different (competing) stakeholders, Blockchain could offer a trustworthy solution. Transactions that are considered privacy- or financially sensitive normally require complex arrangements to be in place between stakeholders before any data exchange can take place. The Ministry would like companies to encourage experiments with Blockchain solutions that would standardize the conditions and facilitate the exchange of this kind of data between stakeholders in the MaaS ecosystem. Also, the technological challenge of processing high

transaction volumes at very low latencies is a subject of interest, to understand if such a solution could be scaled to process all foreseeable MaaS-related transactions for the Netherlands.

The Blockchain Challenge offers a platform for companies willing to run feasibility tests in the MaaS ecosystem and to present their Blockchain solutions to the Ministry of Infrastructure and Water Management.

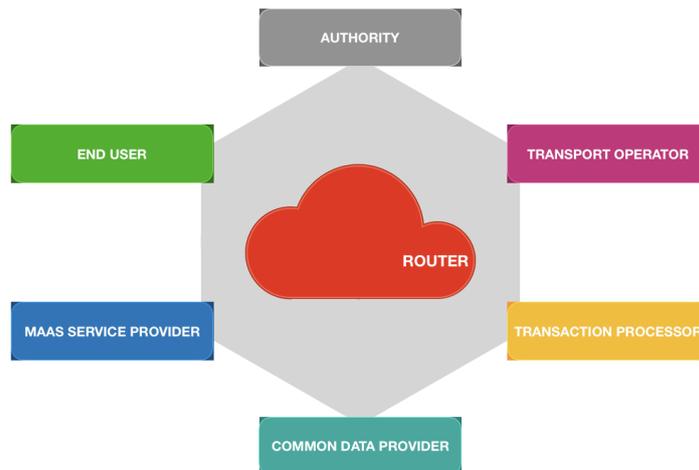


Fig 1: Stakeholders in the MaaS ecosystem setup in the Netherlands

3. The data string transaction format within the Ecosystem

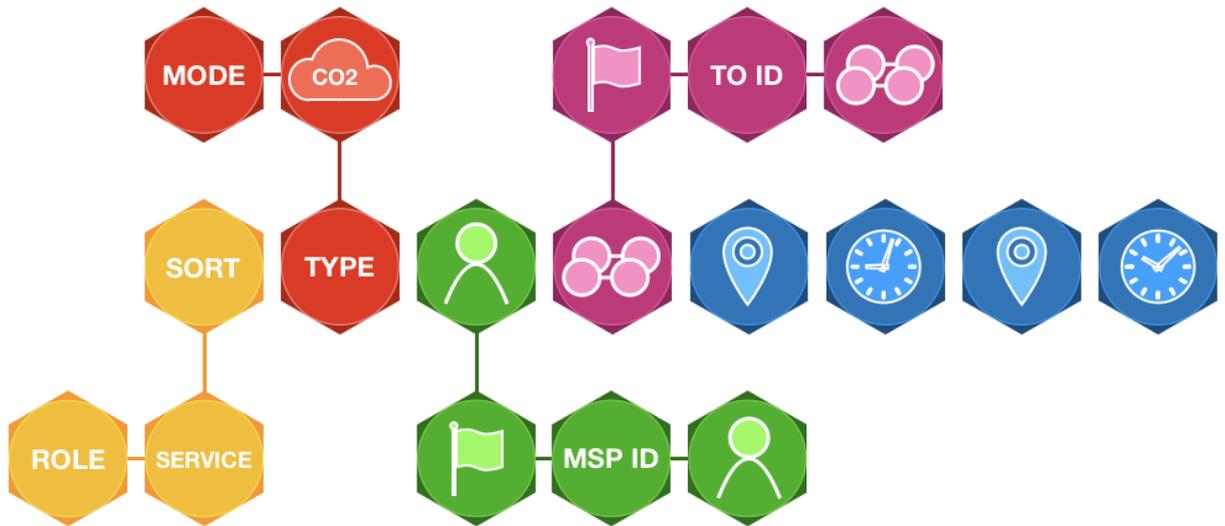
In the MaaS ecosystem, transactions between stakeholders will be registered and processed through a standardized data string, with the following definition:



"The data string contains information for logging a booking of a journey leg (S0), and identifying a payment after a completed journey leg (S1). It requires entities to be unique as to be unique on its own. For policy goals it renders insight in how mobility flows regarding the sort (service and role) and type (mode and CO2) in time and space."

The data string therefore describes a displacement during a journey (a single leg), that can be part of a multi-leg journey. Multiple data strings are required in order to describe an entire journey, both in planned form (S0) as in executed form (S1)

The following elements are included in the complete data string:



Containing (from left to right):

SORT

- End User role, e.g. private, commuting, work-work, student, senior, juvenile, disabled
- Service rendered, e.g. proprietary, public transport timetabled, public transport on call, carpooling/ride sharing P2P, ride hailing B2C, subsidized transport on call G2C

TYPE

- Mode, e.g. train, bus, subway, tram, boat, car, bike, moped, scooter, segway, watercab, on foot
- Energy label, A to G (t.b.d.)

END USER

- End User ID
- End User Data, e.g. preferences and conditions
- Country of provenance
- MaaS Service Provider ID

ASSET

- Asset ID
- Country of provenance
- Transport Operator ID

FROM A TO B

- Start location
- Start time
- End location
- End time

4. Setup of the Blockchain Challenge

The Ministry envisions the following process for the Blockchain Challenge:

Deadline for application	<p>October 1st 2019</p> <p>Application requirements:</p> <ul style="list-style-type: none"> • Description of proposed approach and solution (max 2 A4) • Statement agreeing with conditions and evaluation points
<p><u>Phase 1</u> Beginning of October 2019</p>	<p><u>Blockchain Challenge kick-off on October 10th 2019 in Netherlands (location t.b.d.)</u></p> <p>Session with all applicants with the goal to:</p> <ul style="list-style-type: none"> - Define formatting of data string values - Define which trust-related transactions/data string elements need to be covered by the challenge - Define necessary data volumes for testing and data string generation - Define level of summarization of public end results - Confirmation of definitive applicants for phase 2
<p><u>Phase 2</u> October-November 2019</p>	<p><u>Set up of Blockchain Challenge</u></p> <ul style="list-style-type: none"> - Set up and test necessary system connections - Set up and test data string generation
<p><u>Phase 3</u> December 2019</p>	<p><u>Execution of Blockchain Challenge</u></p> <ul style="list-style-type: none"> - Run feasibility tests for applicants' Blockchain solution
<p><u>Phase 4</u> December 2019 (possible extension into 2020)</p>	<p><u>Blockchain Challenge results</u></p> <ul style="list-style-type: none"> - Reporting and presentation of results - Publication of summarized results

5. Conditions for participating in the Blockchain Challenge

The following conditions for participating in the Blockchain Challenge apply:

- i. The Blockchain Challenge is open to any and all companies interested in presenting their Blockchain-related solutions to the Ministry of Infrastructure and Water Management in the Netherlands.
- ii. Companies are asked to present their findings and learning to the Ministry. If required this can take place under the condition of confidentiality.
- iii. Companies will not receive any financial compensation for participating in the Blockchain Challenge.
- iv. Summarized results of the Blockchain Challenge will be published by the Ministry after approval by all participants. The goal is to share broad insights into the feasibility and success of the proposed solutions, not the underlying technical setups and execution.

Applicants interested in participating in the Blockchain challenge are requested to comply to the following:

- v. Applicants should have the capability to process multi-modal MaaS transaction records, with the feasibility to cover all transaction volumes of multi-modal MaaS travel in the Netherlands and to create a revenue sharing record among multi-modal MaaS-related transportation entities in the Netherlands in a Blockchain-solution
- vi. Applicants should be able to process transaction volumes of approximately 7 million transactions per day, 2.5 billion transactions per year.
- vii. Applicants should provide an hypothesis for a feasibility test to show the capabilities of their Blockchain solution and are requested to explain the scalability potential for a nationwide deployment of the proposed Blockchain solution.

- viii. Applicants should have the capability to increase the transaction volume of multi-modal MaaS transaction records in their Blockchain solution in the near future

6. *Evaluation points for the Blockchain Challenge*

Companies applying and participating in the Blockchain Challenge are asked to focus the reporting of their solutions on the following evaluation points:

Performance

- i. Evaluation of capabilities for real-time recording of multi-modal MaaS transactions in a Blockchain solution, based on the current transaction estimation for the Netherlands (see section 5, sub vi.).
- ii. Evaluation of scalability potential to theoretically increase the transaction volume of multi-modal MaaS transactions in the near future.

Record/Share data scheme

- iii. Evaluation of capabilities to make/register transaction records in a Blockchain solution.
- iv. Evaluation of capabilities to share the data records on the Blockchain to necessary entities in a dashboard/visual example.

Draft cost estimation

- v. For a Blockchain solution to become feasible as a common infrastructure among multi-modal MaaS related entities in the ecosystem, applicants are requested to provide a draft cost estimation for the solution.

7. *Contact information*

For more information on the Blockchain Challenge, please contact:

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