URBAN

PRE-LIMINARY PROJECT BRIEF, CALL FOR PARTNERS

A Sams-Norway project in partnership with

Infracity I NUDA I MHtecH I Applied Autonomy I University of Southeastern Norway

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INDEX SUMMARY

1.0 INTRODUCING THE STAGE FOR URBAN

Cluj-Napoca is a town in Romania, Transilvania, on the river Someşul Mic, ca. 320 km northwest of Bucharest. The city has 328,000 inhabitants (2020). Cluj-Napoca is one of Romania's largest cities and Transylvania's ancient capital. It has significant trade and industry. In recent decades, the emergence of many IT companies has made the city's business community one of Romania's most modern. The more traditional industry is divided into many different industries, such as the metal, machine and textile industries, production of car parts, furniture, shoes, leather goods, porcelain, medicines, cosmetics, and food.

The city has one of Romania's most famous universities, Universitatea Babeș-Bolyai, where Romanian, Hungarian and German are taught. The university has its own department of Scandinavian languages and literature, founded in 1991, where it has been specifically taught Norwegian throughout the period.

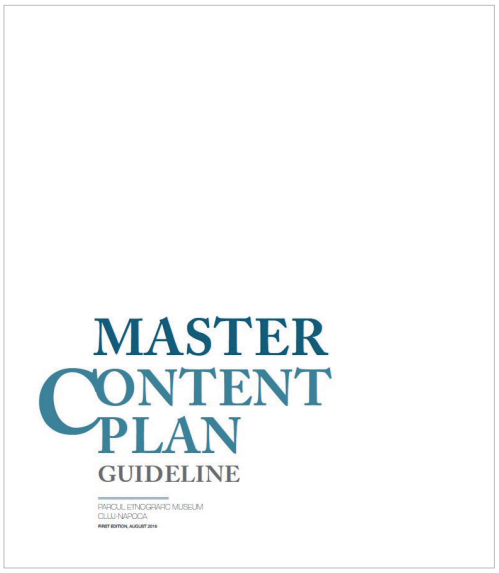
Cluj has one of the most progressive sub-urban cultures, many of which are involved with themes related to Architecture, Urbanism, Culture, Technology and more. The city has good railway connections and is located along the A3 motorway, which is only partially completed. Avram Iancu International Airport 9 km west of the city center has increasing traffic, however in need of upgrade and expansion.

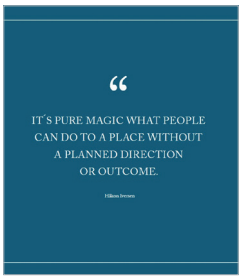
1.1 The relationship between Cluj and Norway

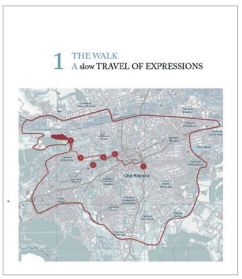
Since 2014, NUDA *(Nordic Urban Design Agency)* have been working with The Transylvanian Museum of Ethnography, The City of Cluj, and Cluj County Council on several EEA funded projects.

The two most recent projects are being finalized in May 2022. In the period 2014 to 2018 NUDA developed, as an extension of the EEA funded project: *"CONSERVARE – RESTAURARE ȘI PUNERE ÎN VALOARE A BISERICILOR DIN LEMN PETRINDU ȘI CIZER"* a Master Content Plan which extended the project scope to also include the city and the region to further empower the outdoor *"Ethnographic Park Romulus Vuia"* as destination. It was followed up by NUDAs initiative to establish an international contest of solutions for extending the Ethnographic Park *(https://www.nuda.no).*

The **Master Content Plan** is the first of its kind implemented in Romanian planning history and was credited by the Norwegian Directorate for Cultural Heritage as one of top ten best EEA funded projects recent decade in Romania. Since 2013, The University of Southeastern Norway School of business (USN HH) has strengthened its relationship with the academic milieu of Cluj.







More than 9 teachers from Babes-Bolyai have been visiting teachers at the USN HH and 13 students have taken courses or done their bachelor and master thesis at USN HH. More than 5 academic employees at the USN HH have been visiting teachers either as part of an Erasmus exchange program or arranging summer schools at Babes-Bolyai and USN HH. In 2016, we received a delegation from Babes Bolyai and Cluj City Hall which was followed-up by a visit from Norway the next year. The student and academic relationship has been centered around research topics such as leadership styles, corporate responsibility, marketing management strategies, innovation and regional economic development, user centric driven innovation, service design, globalization and ICT, and smart cities.

1.2 URBAN is aligned with ongoing mobility strategies

In the Master Content Plan, transportation and infrastructure related to mobility in ge-

neral was addressed as “an opportunity” for both improvement and connector between multiple areas. Related to our project proposal, transportation is an issue as it currently is non-existing between the city center and outdoor museum. This includes also the industrial site area west of the outdoor museum.

Recently the Sustainable Mobility Plan for the period 2021-2030 was approved by the HCL. An Elaboration of the Sustainable Urban Mobility Plan ***(hereafter called SUMP)*** aforementioned period in the Cluj-Napoca Metropolitan Area has considered emerging strategies at a global and European level, and how urban mobility and transport is identified internationally. Mobility and transport are key elements for reducing negative environmental impact, improving the green economy and increasing quality of life. It is addressed in multiple strategic documents, especially in terms of carbon reduction targets, which are becoming increasingly important as global drivers towards green sustainability.

Sustainable Urban Mobility Plan,
Alba Iulia- Romania

The **SUMP** for the period 2021-2030 was developed in partnership by the consulting and planning companies Civitta Strategy & Consulting SA and TTL Planning SRL and supervised by the Cluj Metropolitan Area Intercommunity Development Association. The SUMP was developed through a transparent and participatory process. Relevant stakeholders, citizens and civil society representatives, public transport operators and economic operators from the studied territory were consulted in all stages of the development of the SUMP, with questionnaires and opinion polls applied.

In reference to our project approach, it is relevant to register that SUMP has put in motion:

- *Purchase of 30 electric buses. October 31, 2018, the City Hall of Cluj-Napoca signed the financing contract for the purchase of 30 electric buses.*

- *Electric buses are purchased through the Regional Operational Program (ROP) 2014-2020, Priority Axis 4 - Supporting sustainable urban development, Specific Objective 4.1 - Reducing carbon emissions in county seat municipalities through investments based on sustainable urban mobility plans, in within the project "Renewal of the public transport fleet in Cluj-Napoca through the purchase of electric buses". The value of the financing contract, for the purchase of 30 electric buses, is 85,129,227.42 lei. The delivery time of the new trams is 9 months from the date of entry into force of the contract.*

The general objective of the project is to reduce carbon emissions in the Municipality of Cluj-Napoca, by purchasing and putting into operation 30 electric buses, based on the approved Sustainable Urban Mobility Plan. This is done by replacing 30 old buses, with non-euro and Euro 2 pollution norms, used in the urban passenger transport system and equipped with diesel engines, with new buses, equipped with electric powertrain.

The advantages of implementing this new type of vehicle for public transport are the following:

- *Improving the quality of public transport travel by increasing quality and safety standards in the use of these modes of transport:*

- *Shortening the travel time for public transport, without worsening the traffic conditions in the study area and outside it;*

- *Reducing road traffic congestion, accidents and the negative impact on the environment by lowering the modal share of private car transport.*

By implementing the project, it is expected to reduce CO2 equivalent emissions in Cluj-Napoca, by reducing them by 501 tons of CO2 equivalent / year in the first year after the completion of

the project. At the same time, it will lead to an increase in the number of passengers transported within the public passenger transport systems in Cluj-Napoca, with a number of 19, 210 passengers in the first year after the completion of the project. There will also be an annual decrease of 12,979 trips with their own.

The URBAN project can further contribute to the reduction of CO2 equivalent emissions by introducing a dedicated mobility service complementing the public transport system for areas and destinations that are in need of upgraded mobility services.

1.3 Priority project planned:

" Increasing the pedestrian space in the urban area - rehabilitation of the pedestrian / bicycle area extension - Lucian Blaga Square, Napoca Street, Petru Maior Street, Emil Isac Street ".

Proposes: Urban redevelopment of streets (approx. 20,000 sqm) located in the central area of the municipality by increasing the urban space for pedestrians and cyclists. The square is one of the most famous places in Cluj, where the old and the new are twinned in an architectural ensemble made up of constructions belonging to the end of the 19th century. The area is historically developed, with many points of tourist interest, but also administrative and shopping. This is a project that is not initiated, and in that case subject for URBAN to embrace as part of our project scope.

It aims to:

- *Reduce parking in the targeted area (with the provision of parking spaces for people with reduced mobility and residents).*
- *Resize street profiles by widening the pedestrian space and changing the pavements related to the pedestrian space, hence the reorganization of traffic flows; arranging / creating bike lanes.*
- *Design placement of street furniture for rest (benches, taps) and street art objects, well integrated into the urban context throughout the targeted area.*
- *Create new green spaces and address new designs for tree alignments / flower planting along streets and pedestrian street lighting - LED type.*
- *Arrangement of lanes dedicated to public transport*

- *Make it easier for the elderly and disabled to get around.*

- *The project will ensure safe and efficient operation of any kind of autonomous vehicles in public traffic.*

Introduce ITS systems (sensors, communications, traffic management systems) to optimize the use of available roads and give pedestrians, micromobility and public transport priority.

1.3.1 Priority project:

"Arrangement of lanes dedicated to public transport - STAGE I"

Proposes: Reducing congested traffic caused by intersecting vehicles and resulting in a very slow public transport system and major deviations from the established schedule. This problem decreases the efficiency, quality and attractiveness of the public transport system. The East-West axis is the main column of the public transport system, being crossed by approx. 65 buses and trolleybuses per hour in each of the 2 directions, with a potential to transport, in ideal theoretical conditions, 8500 people per hour in each direction.
The positive effects will consist in the physical segregation of the lanes and will allow access to emergency or commercial vehicles, by discouraging their use by other vehicles. Strips dedicated to public transport do not involve the reduction of parking spaces or sidewalks or lanes dedicated to cyclists.

https://primariaclujnapoca.ro/proiecte-europene/mobilitate/

1.4 The Green Transition through the Green City Accord

Cluj-Napoca has green visions for the future. The politicians have communicated that Cluj-Napoca aims to be Romania's greenest city within 2030.

More than 50 cities have signed the **Green City Accord**. This agreement sees local authorities committing to achieve ambitious environmental goals by 2030 on air, water, nature and biodiversity, circular economy and waste, and noise. From Romania 4 cities – Alba-Iulia, Bistrita, Cluj-Napoca and Tulcea, will benefit from financial assistance to become greener, cleaner, and healthier.

The Green City Accord is a movement of European mayors committed to making cities cleaner and healthier. It aims to improve the quality of life for all Europeans and accelerate the implementation of relevant EU environmental laws. By signing the Accord, cities commit to addressing five areas of environmental management: air, water, nature and biodiversity, circular economy and waste, and noise.

Today cities across the European Union face many challenges. Air pollution is a serious problem posing a real risk to health, noise pollution is on the increase, urban sprawl is affecting the avai-

lability of green spaces, while the generation of waste continues to have an impact on the local environment. But cities can also be leaders in environmental protection and can play an important role in improving air and water quality, in enhancing biodiversity protection, in tackling noise pollution, and in moving towards a more sustainable, circular economy.

To celebrate the involvement of a growing number of cities that form part of the Green City Accord community, a high-level signatory online ceremony was taken place on 22 September 2021. Mayors, local leaders, and stakeholders joined the European Commissioner for the Environment, Oceans and Fisheries Virginijus Sinkevičius in a unique opportunity to discuss the Green City Accord and their environmental priorities.

1.5 Major goals

In joining the Accord, mayors agree to taking further action to achieve the following goals by 2030:

- *Significant improvement in air quality in cities, moving closer to respecting the World Health Organization's Air Quality Guidelines, while ending exceedances of EU air quality standards as soon as possible.*

- *Important progress in improving the quality of water bodies and the efficiency of water use.*

- *Considerable progress in conserving and enhancing urban biodiversity, including through an increase in the extent and quality of green areas in cities, and by halting the loss of and restoring urban ecosystems.*

- *Advance towards the circular economy by securing a significant improvement in the management of household municipal waste, an important reduction in waste generation and landfilling, and a substantial increase in re-use, repair, and recycling.*

- *Significant reduction in noise pollution, moving closer to the levels recommended by the World Health Organization.*

Such a statement and promise lay the grounds for new projects addressing:

- *Green energy solutions*
- *Electrification*
- *New user-centric mobility solutions*
- *Priority towards renewable energy*

The URBAN initiative fits the city visions and dictates a concretized proposal which will directly address the aims for a greener transition. The URBAN initiative achieves this through complementing the existing public transport system with zero emission vehicles and reducing the need for personal car traffic. To make such a project realistic, and innovative, at the same time, it is essential that URBAN connects to – and follow up – ongoing plans.

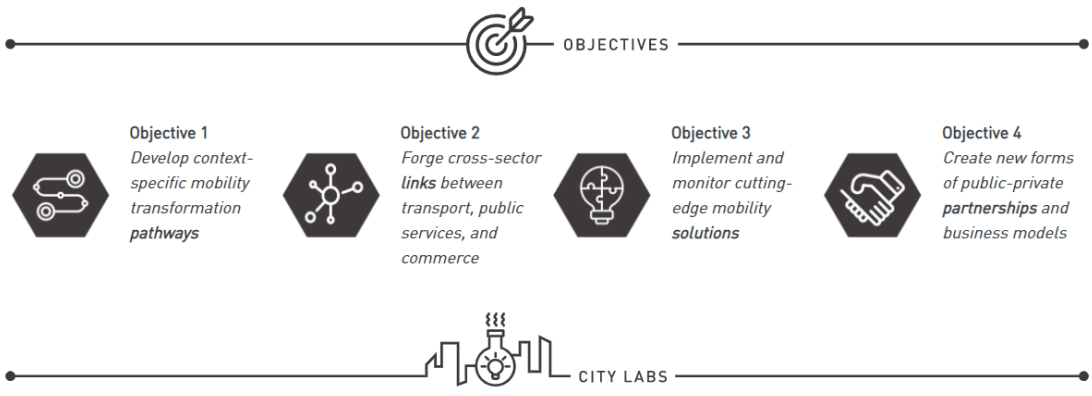
2.0 THE URBAN PROJECT BRINGS SOLUTIONS TO THE PROBLEM

Mobility plans are governmental driven initiatives. In Cluj-Napoca the city has plans for expanding and upgrading public transportation, and in recent years the city has experienced a growing demand for electrical cars. This of course expands the need for more electricity which is becoming a limited resource, making the ongoing establishment of charging a challenge within the city borders. In addition, experience from Norway indicates that electric cars are used more often and for shorter trips than fossil fueled cars. As such electric cars still adds to the congestion and parking space challenges of city centers.

To make a difference in such typical governmental planning projects, URBAN needs to innovate new mobility concepts and solutions in areas where implementation is immediately realistic. Therefore, the project idea is centered around solving:

1. **A concrete problem**
2. **A deliverance of concrete solution**
3. **A smart mobility concept**
4. **A scope for novel innovation and business opportunity**
5. **A point of access for green products**
6. **A direction that will solve a specific transportation issue**

With this as a starting point, it is strategic of URBAN to address a direct follow up on the ideas and concepts described in the **Master Content Plan,** where also the proposed route for implementation is already described between the city and the outdoor museum and address the ongoing processes initiated in SUMP, where the objectives (illustrated below) are very much aligned with URBANs intentiones.



The follow up is strategically related to the relationship already established in Cluj, making it eas-

ier to connect with the right people, organizations, and funding for the purpose of achieving project realism. Finally, it is strategic to address the political visions for Cluj as Romania's greenest city.

2.1 The URBAN project 1 to 6

1. A Concrete problem – There is no public transportation between the city and the Ethnographic outdoor museum. This makes it difficult for the museum to attract people and an important cultural destination is not optimized as a city asset. This is also a concrete problem for the technology and industrial park adjacent to the outdoor museum.

URBAN can provide solutions that can contribute to solve two problems in one take.

2. A deliverance of concrete solution – There is a realistic opportunity for URBAN to deliver a concrete solution through the partnership consortium. A mobility plan designed for the above-mentioned issue will be a perfect fit for autonomous bus solutions. It will enable more accessibility between the city, the outdoor museum, and the industrial park. It will embrace new target groups of potential users, and it will dictate a change of mentality as the project takes its destination as a starting point for developing mobility solutions. With our knowledgde and competance, we will and deliver the hole project from start to end, and all the phases in between

URBAN can solve transportation issues and answer city visions.

3. Smart mobility concept – Turning a mobility plan into an accelerator for improved destination experience, we put people, culture, and experience in the center of focus. Mobility and technology become necessary, enable accessibility and advocate Cluj`s green ambitions. It takes the museum's issues seriously and embraces culture and urban design with new perspectives. The lack of public transport is also a problem for the technology and industrial park adjacent to the outdoor museum, giving employees and visitors no choice than to come by car. Resulting in more traffic and demand of parking.

URBAN can contribute to new scalable mobility concepts for Cluj-Napoca.

4. A Scope for novel innovation and business opportunity – in a new fashion where the combination of new mobility concepts empowers the introduction of autonomous buses, through a mobility plan designed on data driven facts. The novelty of the smart mobility innovation will attract high interest from other cities and urban planners. The solutions entail great potential for new business opportunities as the mobility services lay the foundation to disrupt and invent new public transport systems based on user centric approach. Cost-effectiveness will be possible when an operator can take care of several buses.

Introducing smart mobility also opens up for designing different experiences where digital solutions, sensors, geofencing etc together with storytelling through visuals and audio, make the transport into an event for the visitors. Possibly attracting new visitors and increasing the attractivity of the public transport service.

URBAN delivers new innovative business opportunities and green tech-solutions.

5. A point of access for green products – aligned with SUMP, URBAN can provide several new points of access for green products such as autonomous buses, micromobility, digital solutions, simulations tools such as Seidr and more.

URBAN can provide new green products to accelerate the green transition and growth of sustainable business opportunities.

6. A direction that can solve a specific transportation issue – hence to the concrete problem addressed through The Master Content Plan where the city center and outdoor museum needs to be connected.

URBAN can solve the problem of attracting more visitors to visit the city and the museum based on sustainability transportation.

3.0 ACCELLERATING GREEN TRANSITION WITH DESTINATION MOBILITY

URBAN defines mobility in new terms. In normal context mobility is a vital part of city planning and currently an important accelerator for green transition. In a competitive world, sustainability is the new currency where value and innovation are measured.

Cities are all objects for competition, either it is the newest solutions, innovative ideas, economic growth, population growth or implementation of daring city visions. In this race of competitiveness, destinations are created and revitalized. In the tale of green transformations from vehicle-based cities to pedestrian and bicycle friendly cities, new designs for public spaces and transportation solutions are re-defining city DNA structures. Accessibility is now the most valued issue to solve, both for residents, jobs and tourists.

Mobility is the new planning tool for acceleration of green city centers. In this, connecting destinations becomes crucial, and in that sense in highly need of innovation.

By utilizing the opportunities of electric and digital mobility, the individual needs for one destination can be met with high frequency between rides and flexible routes, reducing the need for private cars. These rides can be closely connected to larger mobility-hubs and seamlessly integrated to mass transport solutions between destinations. This brings an opportunity of both meeting the local needs and at the same time takes advantage of the effectiveness of mass transport. Setting up a system of systems designed around destinations opens up new innovation areas. Combining several actors' needs for mobility, energy and connectivity with tailored solutions on the basis of real world data, experience and scenario simulations gives more room for finding efficient, effective, affordable and robust solutions across seasons and sizes.

4.0 URBAN PROVIDES A NEEDED VALUE PROPOSITION

We know the city, the customer and the problem. URBAN intends to provide an in-depth analysis of the city, the problem and why, and how, URBAN can solve mobility through our solutions. Our value proposition secures the one reason why our product and complementary service is best suited for that Cluj-Napoca and the Etnografic Museum.

URBAN will bring innovation to the museum and the city, focus on sustainable solutions, create media attention and not least create engagement among the population. Our offer will give you real social benefits, confirmed through simulation and planning. We deliver a platform for new forms of collaboration, a meeting point for culture, technology and mobility, which creates value within several segments.

A complex system as a city and a mobility system, is never fully “fixed” by addressing needs separately and in silos. At the same time, trying to solve everything at once- will be too costly and difficult. URBAN can offer a systemic approach to city mobility, balancing the need for a holistic and highly integrated solution with the need for a step by step implementation. Through scenario simulations, linking real world data, experience and mobility systems URBAN will provide a basis for evaluating interaction with other mobility services and modes. Thereby URBAN facilitates a portfolio approach to a mobility plan and a structure for exploring the opportunities given by technology without losing the human out of sight.

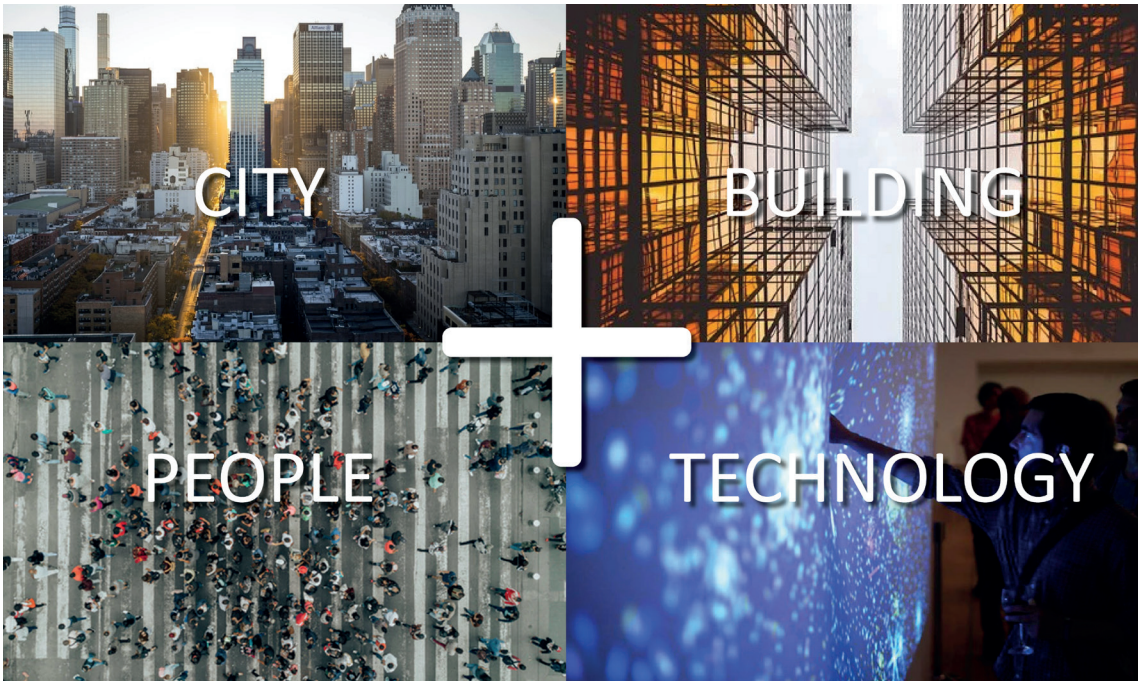
5.0 CONNETING CITY, BUILDING, PEOPLE AND TECHNOLOGY

URBAN redefines city planning through mobility as new planning tool for great destinations. In a traditional approach, this would be a typical city planning – or urban design – project.

It has all the elements related to transportation, new guidelines for infrastructure planning, connectivity strategies, urban analysis and more. However, URBAN takes a different approach where the overall strategy is about connecting the city together through its buildings, focusing on people movement and experiences, provided with new technology. As discussed in section 2.0, the six approaches are isolated sub projects, though under one overall plan.

URBAN takes into account the whole city as one, though the defined project will be very specfic with the intention of strengthening connectivity between the city center and the outdoor museum and indusrial business district.

The partner consortium is the real power-bank for inspiration, knowledge and competence. It is the key-driver enabling the process from vision, finance, to descision and implementation. Therefore it is paramount that URBAN becomes a partnership driven project. It is in the overlapp between different professions and skillsets URBAN will create innovation and new directions for how Destination Mobility can become thee important tool for mobility and city development. Also related to new business models and manage the green transition.



6.0 DELIVERANCE THROUGH A TAILORED PARTNERSHIP MODEL

URBAN delivers a dynamic mobility offering tailored to the needs of destinations such as the Cluj-Napoca Etnografic Museum enabled by a unique value chain consisting of companies with complementary competence. The value chain of companies combines three key areas; operational experience with autonomous mobility systems; competence and experience on urban planning and architecture; as well as competence and experience with transport system, energy system and emissions modeling and simulation. Together; this multidiscipline blend of competence and experience will deliver dynamic and innovative autonomous mobility services built on the best possible data and design basis. The partnership further aim to enable local cooperation partners to handle key parts of the on site operations, and thereby contributing to the local value creation.

6.1 About MHTECH / www.mhtech.no

MHTech AS was established in 2016 with the aim of developing sustainable and environmental-friendly solutions for the transportation and maritime sectors. The company focuses on working together with customers to identify strategic and climate-friendly solutions, including measuring CO2 emissions and calculating profitability of operations using a combination of operational data and Life Cycle Assessment technology. MHTech's core services include feasibility studies, consulting services, and evaluation of sizing of drivelines, batteries and energy/charging infrastructure for fully electric or hybrid vehicles and transportation systems.

MHTech AS has extensive expertise developing models of energy consumption for different types of road and maritime traffic, as well as estimating the energy consumption of electrical vehicles (EVs) and optimising charging infrastructure using proprietary algorithms. MHTech has the ability of simulating the power consumption for integrated electric transport systems taking into account the charging infrastructure, battery capacity, vehicle characteristics, routeplan and traffic scenarios. They are a team of 5 full time employees based in Moss, Norway. In addition we have strategic cooperation partners that complement our competence and add capacity as needed.

The project proposal fits very well with their plans for the company, as it gives them an opportunity to consolidate and strengthen their position as a leading provider of specialized software for simulating, predicting, and monitoring energy consumption of electric vehicles and road going transport systems.

6.1.1 Value proposition in the project

In this project, MHTech can leverage our existing algorithms in combination with insights, data and knowledge of the cooperation partners in the project to add value in the following ways:

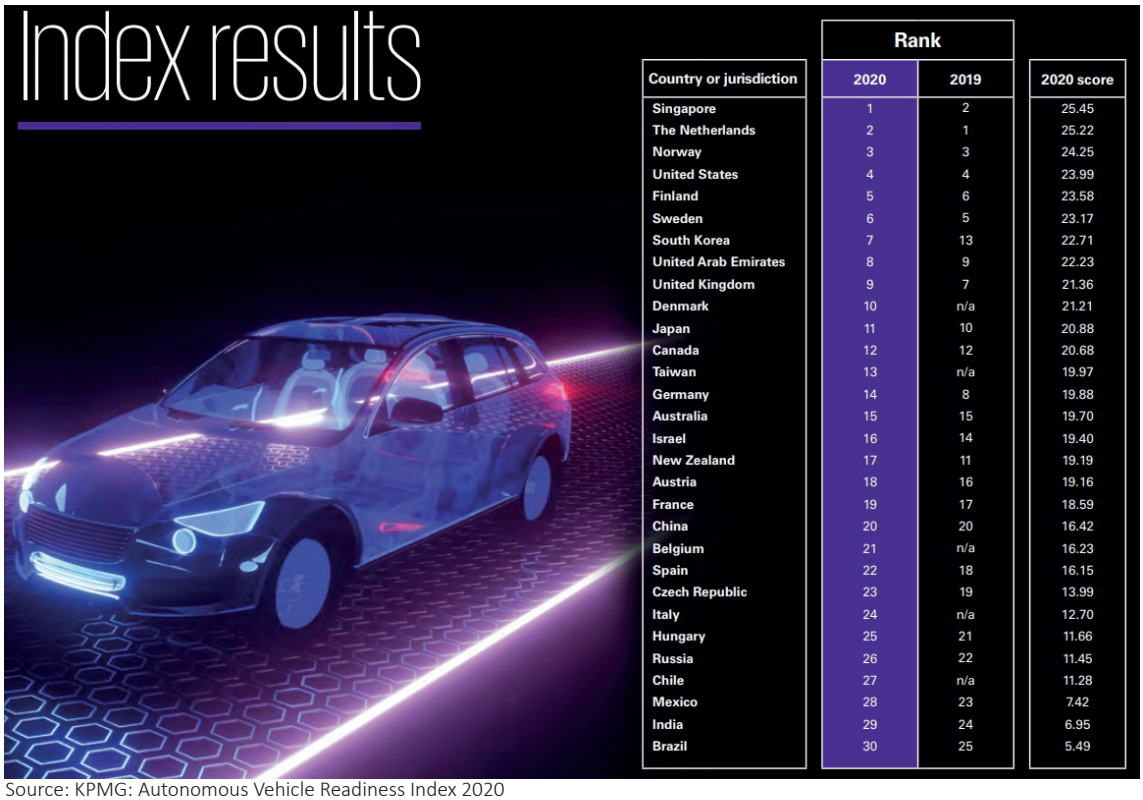
Run desktop simulations and tests for variations in route plans and different operational scenarios prior to real world implementation - This can help to reduce risk and improve availability of the overall system when in operation top rovide decision support while in operation for changes that may be needed due to unexpected events, i.e. road closures, traffic jams, equipment malfunction or similar.

Demonstrate the environmental benefit, primarily in terms of greenhouse gas emissions, that is achieved by the system, both for the client on an aggregated level and for the end user on a per trip level. In addition we see the following potentials for added value that can be achieved by close cooperation between the project partners:

Use the data gathered by XFlow, the algorithms developed by MHTech and the competence of InfraCity to drive continuous improvement and implement changes based on data predictions to optimize efficiency.

6.2 About APPLIED AUTONOMY / www.appliedautonomy.no

Applied Autonomy delivers knowledge, solutions, and services for sustainable autonomous transportation. The company offers services for piloting and testing of autonomous vehicles, and develops the necessary control centre systems for implementation and operation of automated transport and service solutions.



Country or jurisdiction	Rank 2020	Rank 2019	2020 score
Singapore	1	2	25.45
The Netherlands	2	1	25.22
Norway	3	3	24.25
United States	4	4	23.99
Finland	5	6	23.58
Sweden	6	5	23.17
South Korea	7	13	22.71
United Arab Emirates	8	9	22.23
United Kingdom	9	7	21.36
Denmark	10	n/a	21.21
Japan	11	10	20.88
Canada	12	12	20.68
Taiwan	13	n/a	19.97
Germany	14	8	19.88
Australia	15	15	19.70
Israel	16	14	19.40
New Zealand	17	11	19.19
Austria	18	16	19.16
France	19	17	18.59
China	20	20	16.42
Belgium	21	n/a	16.23
Spain	22	18	16.15
Czech Republic	23	19	13.99
Italy	24	n/a	12.70
Hungary	25	21	11.66
Russia	26	22	11.45
Chile	27	n/a	11.28
Mexico	28	23	7.42
India	29	24	6.95
Brazil	30	25	5.49

Source: KPMG: Autonomous Vehicle Readiness Index 2020

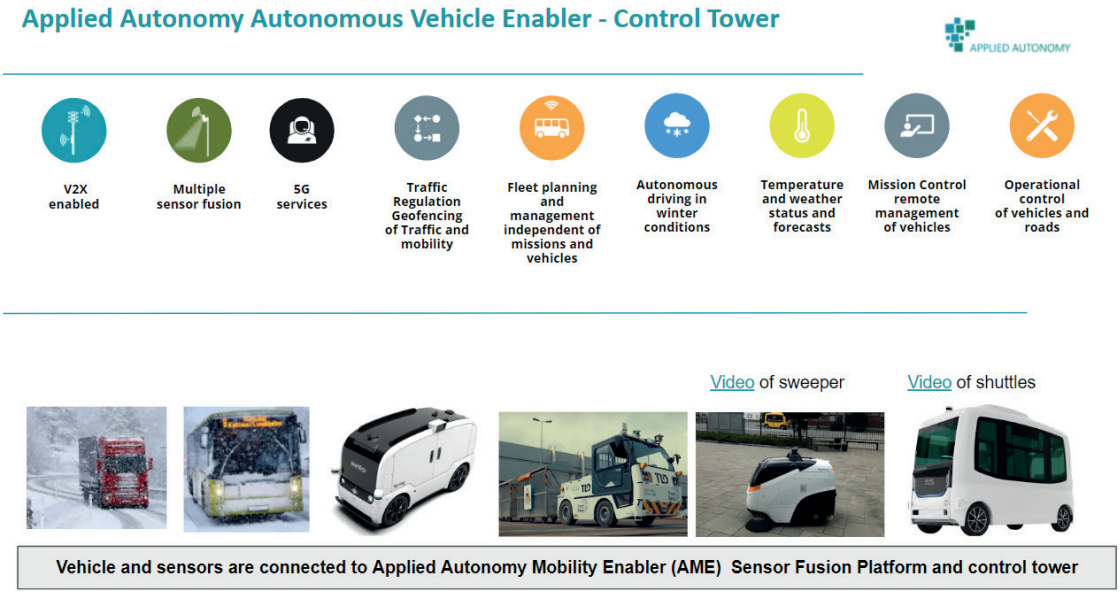
Their pilots and demonstrators take place in Norway and Europe. Our level of involvement varies from helping the customer choose the best vehicle to complete solutions. Through their platform services, they also work on transport data management projects. AA are involved in both European and Nordic consortiums, developing autonomous transport going forward in a sustainable

and innovative way. Norway is ranked third in KPMG´s 2020 autonomous vehicle readiness index, amongst others thanks to Applied Autonomy. Applied Autonomy was established by Kongsberg Innovation in 2017, and is now owned by the industrial companies in Kongsberg, founder Olav Madland, and transport operator Vy.

2021 ® Applied Autonomy

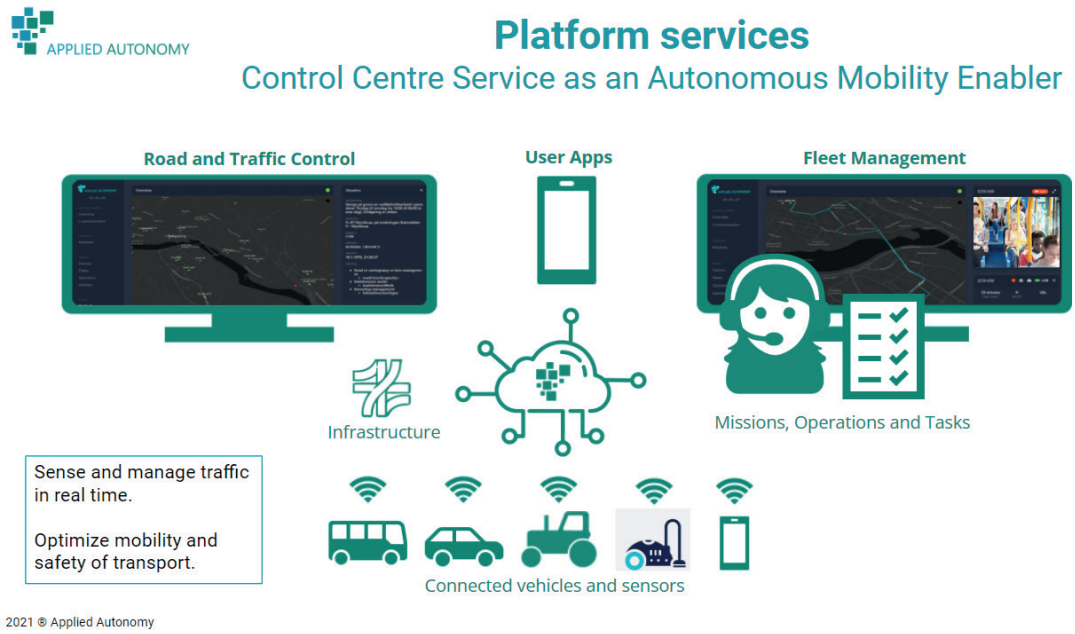
1) Autonomous vehicle enabler - neutral to hardware

Applied Autonomy develops necessary control centre systems that will ensure safe and efficient operation of any kind of autonomous vehicles in public traffic. This provides Applied Autonomy's customers with a unique position to be at the forefront of autonomous transportation.



2) Integrate shuttles in control room solutions

The control tower integrates vehicles, ITS infrastructure and several services from Applied Autonomy. These services are set up and configured to support the vehicles according to the plans and documented permissions to operate, safety cases and surveillance plans.



Value Proposition

- *Applied Autonomy Implement automated vehicles for learning and scaling. This provides improved insight into the utility value and necessary measures for automation and optimization of transport and:*
- *Reduce cost*
- *Reduced complexity of solution*
- *Reduced risk in the solution*
- *Innovation and insight*
- *Positive reputation*
- *Green initiative*
- *Knowledge*

6.2.1 Collaboration with subcontractors

AA offer is based on 2 autonomous vehicles (up to 50 people standing) from our subcontractor. Given the current state of technology, capacity and cost, they feel that this is the best alternative for this project. The number of vehicles can be expanded as needed.

AA are testing this shuttle in Norway today and will deploy the shuttle in commercial traffic during april 2022. This is a first in Europe test with a big autonomous shuttle. See the article in Forbes here: https://www.forbes.com/sites/davidnikel/2022/01/21/driverless-bus-test-announced-in-downtown-stavanger-norway/?sh=326c0de46552

AA have a long history of collaborating with subcontractors on the vehicle side and enjoy a close dialogue with them on all aspects surrounding the deployment of their autonomous vehicles. This means that they have established working procedures and can complement each other in order to move projects forward together efficiently, and also solve any problems that occur quickly.

Due to their close partnership with selected vehicle manufacturers, they are licensed to train operators for their vehicles and are also entrusted to perform a larger number of other tasks surrounding the deployment ourselves (establishing the Site Assessment Report, design of information signs…). This allows AA to have greater control over the project, and also provide a direct link between the different actors. Additionally, they are used to performing a large number of mechanical maintenance tasks and repairs ourselves, which allows us to minimize downtime of the vehicles.

In addition, AA will cooperate with a local public transport operator, hopefully one of Romania's leading coach operators, as a subcontractor.

Experience from similar projects has shown them that local personnel and usage of experienced bus drivers who are used to passenger services and complex traffic are very important. Both to handle the vehicles, but also for local knowledge that will benefit the passengers. Based on their previous projects, AA are confident that local bus drivers will be more aware of other bus services

provided by Local PTA, and can therefore better assist passengers to select the best way to seamlessly travel by public transport.

Applied Autonomy will train operators from the local transport operator so they can perform day-to-day tasks. Not only do they speak the local language, are customer-oriented and service minded, they also have an above average understanding of motorized vehicles, traffic and its challenges, thus increasing passenger safety. In addition, they have knowledge and connections to both arrange the required infrastructure for the operations and also solve any problems that might occur quickly and efficiently. As coach drivers, they also have the required driving licenses and other statutory documents required.

Roles of Applied Autonomy in automated sustainable transport:

- *Define what, where, why*
- *Define the best method and vehicles*
- *Prepare operational plans, risk analysis*
- *Establish necessary permits for the operation*
- *Purchase or rent vehicles and sensors*
- *Establish daily operations*
- *Communicate, evaluate and follow up*

Applied Autonomy does feasibility studies, conducts workshops for planning, talks to local operators and trains local resources.

6.3 About UNIVERSITY OF SOUTHEASTERN NORWAY / www.usn.no

University of Southeastern Norway is one of Norway largest universities with more than 20 000 students with approximate 2000 employees. The university are located in 8 campuses close to the capital of Oslo. The USN School of Business is Norway's largest public business college with approximate 5,000 students and more than 220 employees. We offer Bachelor's and Master's degrees, continuing and further education and a PhD in Marketing Management and Innovation.

The USN HH will support the project within research topic such as:

1. Business model discovery and business opportunity analysis

Adopting and implementing sustainable smart technologies for solving grand societal challenges is assumed to be one of the most important drivers for jobb creation and new business opportunity for the next decades. Based on an entrepreneurial discovery process (e.g. smart specialization- RIS3), the research team at USN will support the project with research capacities to identify future local business opportunities, mobilize, and identify entrepreneurial stakeholders. The research team will draw on its strong experience of applying business model tools, lean startup methods, and service design techniques in business model development processes.

2. User centricity and technology adoption
User centricity and adoption of technology are among the most researched areas in the field of Information Systems. Here, we can draw on a range of existing and well-defined instruments to examine users' attitudes towards adopting new technologies, incentives and motivation for adoption (or non-adoption). Combining adoption and incentive surveys with a qualitative, user-centric approach to development of technology (e.g., involving actual potential users in developing the final solution) allows us to identify problematic areas with the technology, and to take measures to rectify issues.

3. Best practice in green mobility solutions
Green mobility involves a wide range of mobility solutions, where the only thing they have in common is being green, and not running on fossil fuels. We suggest mapping selected cities in order to explore how a city can utilize the best possible combination of different forms of mobility. Urban studies have examined this to some extent, but our combination of Information Systems, Innovation and business studies can add to this by conducting a multidisciplinary study of technological and social needs as well as the physical environment.

4. Smart Cities analysis
The research team at USN has conducted research into Smart Cities since 2014. In this period we have examined a range of Smart City issues, such as citizen involvement and participation in development, the user of sensor technologies in cities, and data analytics for urban planning. This research can be extended to include green mobility.

5. Communication
In order to build knowledge about the project among the population, it is important to have a good communication plan that contains descriptions of who is to be informed when, and about what. Our experience is that it is useful to have an "annual wheel" that shows major events in the project and a plan for how we want to communicate around these.
From previous projects, we are used to the marketing and communication work being led by the Client, but can be supported by us when needed.

6.4 About SAMS NORWAY / www.sams-norway.no

SAMS Norway is a business cluster established in 2018 by industry actors, academia and research institutes to accelerate the development of sustainable mobility and autonomous operations. The cluster has a wide range of partners representing the mobility value chain, including both land and sea mobility. The core focus on sustainable mobility and autonomous operation requires a strong competence in systems design, systems development and systems operations. The cluster's mission is to be the catalyst for co-creation and business development among cluster partners and external collaborating partners. Included in this is process facilitation, project development, partner search and search for funding.

6.5 About INFRACITY / www.infracity.ai

Infracity is a company that developes data-driven applications for sustainable cities, with the ambition to Make Happy Citizens. Since 2019, the company have been engaged with at broad spectre of urban development projects, connecting cities, buildings, people and technology together. Within the company scope, focus is laid on early-stage development and strategical process thinking enabling new projects and directions in already existing projects. Major projects include energy, ports, transportation, rehab of existing real-estate and development of technological applications for the purpose of generate datadriven processes.

Our projects are all data driven and have a sustainability focus. We work with new mobility solutions for cities including micro mobility, apps for sharing of space, rehabilitation of commercial buildings using Proptech, electrical ports, and holistic development of large commercial areas for optimizing energy consumtion, use of area and developing sustainable transport sharing solutions.

6.6 About NUDA / www.nuda.no

NUDA are a Newtork of Knowledge bridging cities, buildings, people and technology. Since 2005, NUDA has developed a broad international Network of Knowledge, and contributed to raise awareness of urban design in Norway. EEA and EU projects are at the heart of NUDA's business deliveries, but they offer services to other projects on several occasions if it is relevant to their core business.

To grow knowledge, there is a need to be part of a wider network where new ideas and perspectives are nurtured and channelled into constructive discussions. NUDA do not believe that individual thoughts are the only way to great solutions. The collaborative strengths of multiple minds and knowledge has proven to expand great visions and perspectives amongst urban designers to search towards innovative ideas, sustainable methods, and distinctiveness.

One of the issues urban design struggles with is the issue of being too unclear as a profession. This makes it impossible to explain urban design in less than half a page, which again makes it difficult for those who are not familiar with the broad scope of competence that urban design as a collective unit actually possesses, to understand and use urban design skills. To be able to fit this program and make it clear and focused, Nordic Urban Design Awards Foundation is depending on the global network of knowledge providing the best ideas and experiences from all over the world.

It will then be Our mission to abstract these ideas and use the best to stake out the clear role of Urban Design, especially relevant to the Nordic setting. NUDAs network covers the Nordic region, UK, Scotland, Poland, Romania, Slovenia, USA, Australia, Germany, Netherlands, Austria, Baltic regions, and France, and still expands strategically through new collaborative partnerships, projects, and research programs. The power of networks is so evident that avoiding possibilities to fuse ideas with other organizations and professions could result in a silent death to the essence of Urban Design as how it was intended to bridge a gap between architecture and planning in the 1960s.

NUDA is a The Network of Knowledge and will thrive to strengthen this in the future to come, also with the purpose of creating great business opportunities through our three services areas.

If any organisation needs help to get EEA or EU projects on track and delivered with high quality, NUDAs three service areas will contribute to this.

Signature Partner

NUDA provide their main services in EEA and EU-funded projects as a signature partner where Norwegian partners are required to get projects and project funding approved.

Connecting people and organisations

NUDA offer the opportunity to get in touch with our Network of Knowledge. Often they see a necessary need for collaboration across professions to solve projects, add extended knowledge to lectures, seminars and conferences. We have more than 15 years of experience in connecting people and organizations in unconventional ways.

Management and program support

NUDA have long and broad experience in project management related to EEA and EU-funded projects. In addition, they are often asked to support various conferences, seminars, training initiatives with writing and structuring of program content, as well as suggestions for topics and speakers. NUDA are experts in early-stage projects and concept development.

7.0 CALL FOR LOCAL PARTNERS AND FINANCIAL SUPPORT

The intention with this project brief is to provide partners in Cluj-Napoca an overview of URBAN as project, and how it can contribute to solve defined challenges related to i.e. transportation, mobility and destination development.

The financial aspect of the project has not been defined yet, and will be done when partners in Cluj-Napoca have confirmed their particiapation. One of the projects strength is the comprehensive partnership model structured around leading tech and mobility companies in Norway. Though each of the partners are leaders wihtin their segment, the partners as a consortium provides new dimensions to projects like URBAN. Combined with partners in Cluj-Napoca, the URBAN project will provide a strong international consortium neccessary for achieving funding and raise the estimated funds of 20- 30 million NOK for first phase.

There will be various opportunities for funding which will be investigated when the consortium have agreed upon the final scope of the project. Besides european funding opportunities, it is URBANs intention to call for local partners in Cluj-Napoca as both partners in the project, and for financial support, provided the URBAN project is of benefit for them.

8.0 TIMELINE AND BUDGET (basis for discussion)

URBAN have only estimated a possible timeline based on similar project experiences, and will togehter with Cluj-Napoca partners define the timeline final in end of Q2- 2022. Our aim is to distribute the brief- as is now- to key personell in Cluj by 8th April 2022 and follow up with a workshop in end of April before a formal meeting 18th- 21st May will be conducted.

As basis for discussion, URBAN proposes an estimated timeline:

2023 / *Audit March Q1, July Q2 - Sept Q3 and deliverance and audit December Q4*
Phase 1 Pre-project / pre operation (6-12 months)

- Foresight / scenarie development
- Simulation and calculations
- Service design / specifications
- Applications for approvals
- Prepare external communication
- Budget and planning / order vehicle(s)
- Budget estimate: 5 mill. NOK

2023- 2024 / *Audit March Q1, July Q2 - Sept Q3 and deliverance and audit December Q4*
Phase 2 Test phase / (12 months)

- Programming and preparations
- Service development
- Infrastructure upgrades (if needed)
- Hiring and educating necessary staff
- Test rides
- Start external communication
- Budget estimate: 10 mill. NOK

2024- 2026 / *Audit March Q1, July Q2 - Sept Q3 and deliverance and audit December Q4*
Phase 3 Ordinary operation and scale up / 2 years as a part of the project?

- Integration to other transport services
- 24/7 operations (staff, systems)
- Service and support
- Budget estimate: 15 mill. NOK

Estimated total budget three (3) years: 30 mill. NOK ***(not verified - experience based)***

URBAN