Towards Smart Mandalay City
Nyein Su Yin and Green Beans[1] and Win Win Nyunt[2]

Abstract
The research paper entitled "Towards Smart Mandalay City" is aimed for the Mandalay City to be a smart, livable and sustainable city in 2025 by initiating the environmental focused approaches. This plan will introduce and will initiate the systems of governance, people; economy and living style of the city dwellers which cause degrade impacts on both natural and human environments as less as possible. The implementers will be working based on the available data and information from secondary and primary sources. Therefore, field visits and surveys would be conducted throughout the city during the proposed time span. Moreover, trainings, workshops, community engagements, public talks, etc. would be organized occasionally through the social media, stakeholders, concerned offices and NGOs to review and fulfill the needs.
Keywords: Smart City, natural environment, human environment, NGOs, social media.

INTRODUCTION
Mandalay is the second largest city in Myanmar with a population estimated to be over 1.6 million (2018) and with a natural growth rate of just over two percent per year. Smart city can be defined as improving methods of dealing with solid wastes, improved sanitation, improved water quality, and reducing pollution and providing public open space. The lack of coordination between environmental management and planning have led to inefficient use of resources and deteriorating environmental condition that affect urban services and the quality of life. There is a need to integrate economics group and environmental sustainability to improve the quality of life. Addressing the challenge requires well-informed, comprehensive, and innovative urban development planning through capable institutional structure. This would include spatial planning that facilitates minimal requirements for journey between work place and home, encourages the use of clean efficient modes of transport, efficient use of limited resources such as water, recycling of waste including waste water, developing infrastructure that takes account climate change and seismic activity, energy efficient design of buildings, waste and water treatment that minimize carbon emission and provision of green open space.

Vision
In 2025, Mandalay City will be a smart, livable and sustainable city, and it will use more information and data to better interrelationships to its community and other aspects.

Mission
- As an eco-friendly place to live and work as an economic hub by integrating with technologies and human resources for citizen lifestyles, economies, research and development
- Encouraging competitive growth and innovation with environmental sustainability and conservation of resources

Goals
- To be a smart environment from the better environment through green environment
- To achieve strong citizen resistance to environmental challenges
- To introduce green and sustainable economies
- To expect the safe quality of life and higher living standard
- To engage with the community and the superior collaborations

---

[1] 2017-18 intake Environmental Studies Specialized students, Department of Geography & Environmental Studies, University of Mandalay, zyfuzz@gmail.com
[2] Dr., Associate Professor, Department of Geography & Environmental Studies, University of Mandalay, winwinnyunt@mu.edu.mm

Strategy

Being a strategy, the smart city implantation program is a 3-year transition program within which period working smarter will become eco-friendly lifestyles and sustainable economics for the regions' governance.

The approach guiding principles include citizen-centered based movements, collaboration organizing, education and training, initiations, innovation and creativity, sustainable development goals, and monitoring.

The Smart City Plan will be implemented that can be expected as the whole of organization outcomes by using the following frameworks:

1. Governance structure and design
2. Development of capacity and capability
3. Engagement with stakeholders and partners (local administration, municipalities, national governments, city service companies)
4. Foundations and solutions
5. Sustainable project

Governance Structure
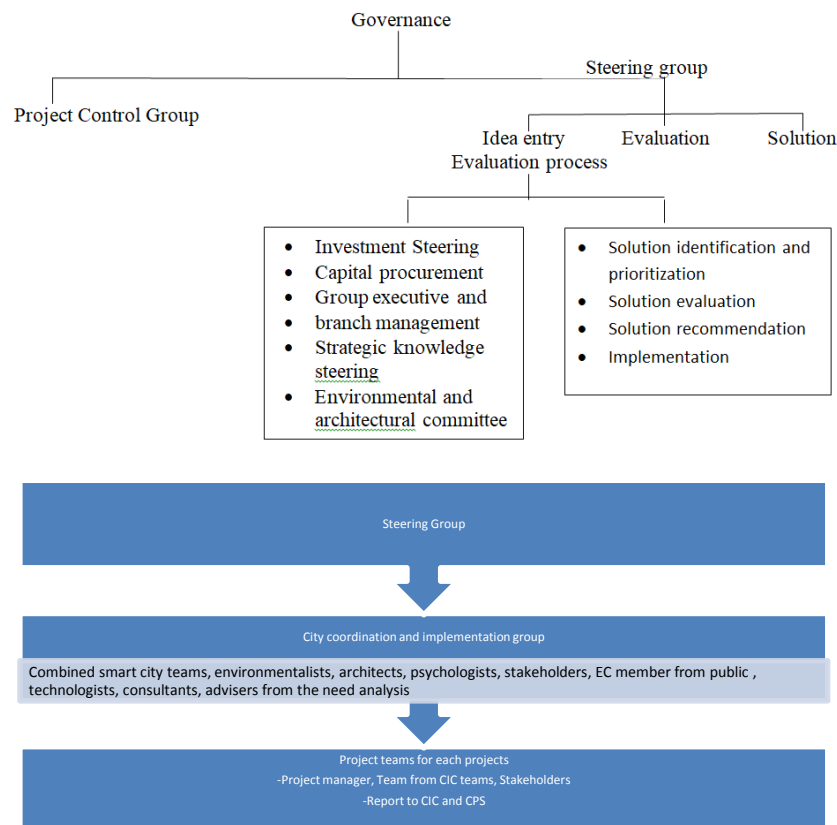
The role of Smart City Team has to oversee the City Implementation Progress with the input of public-based data and will be achieved involvement of all relevant branches stakeholders.

Foundation System

Smart city foundation system includes

- Smart region management platform
- Communication networks connectivity (including Wi-Fi, internet access and social media)

- Electrical services (normal supply) design to support smart connected devices including smart urban infrastructure
- Smart centres and interactive environment to provide community access and a demonstration facilities
- Smart apps – to provide an time/in time ground information to the local communities and government

Solution

Smart governance

Goal – An open, collaborative and coordinative city across national administers, industry and business, and contacts with citizen. It focuses on how our city can operate and how we can set policy to achieve our vision: Own adaption, uses of technology, digital services, uses of data, ways of managements, organizing the relationships with citizen play as a main role in these sectors.

Strategy

Open data and e-services program enable digital services including online submission, tracking of development application and public exhibition, the investigate on line and remote customer services assistance, create a city open data to make freely available open data sets, and adopt internet of things(IOT) to ensure for searchable of diverse data sets.

As a Collective city, develop city partnering framework to identity and promote opportunities for partnering with public+ stakeholders+ government (municipal – regional government. **Digital citizenship u**tilizes social media data mining to map social nets and engage with key influencers and change agent issues. **Start-Up Lead innovation s**upport innovation based events and programs for collaborative problem solving. **Smart city policy and procurement r**eview and update relevant policy framework and principles

Strong citizen resistance to environmental challenges and Safe quality of life and better living standard

The goal is easier and more comfortable life for everyone. It focuses on the quality of environment, development of technology and human living standard (housing). Therefore, technicians and the policy makers will play in key role.

Smart infrastructure comprise free Wi-Fi, efficient internet access, develop smart parking networks including sensors, payment apps and digital permit systems, pilot smart crime prevention apps with key city partners including polices to improve security and safety

City features encompass the housing styles to repair mental health and to create green spaces and green gyms according to the housing styles and architectures. It apply the separated bin management for recycle and non-recycle wastes, sharing solid waste knowledge to public, including industry and business, establishing the co network for solid waste system and management, update the public area quality, update the e-paying systems of public services supports, continue to promote and expound public transportation, and enhancing the cooperation between local people and foreigners, tourisms sites, education and health events.

Better Environment to Smart Environment through Green Environment

The goal is cleaner, greener and more sustainable future with innovation. It focuses on enhancing the use of innovation technology and data in natural, aquatic and built environmental.

Greener spaces **r**eview and update the public green spaces, create a citizen science program to raise education and appreciation of our environment, use technology to actively monitor the impacts of climate change including urban heat and tree canopy, explore the

benefits of an environmental reward points scheme, activate the water tremens system for waste water, and pilot and delay smart bin management in city infrastructure, including the use of waste data to identify key bin location base on demand. Sustainable energy **i**ntroduces efficient and eco-friendly public transportation and reliable information flow.

Community based engagement with superior collaboration

The goal is a city that invests in people and attracts talent to the area and focus on assets and facilities to engage and retain smart people.

- Develop a city app for easy access to services and information on the city
- Support local cultural production by providing local designers, creative and start-up access to city digital platforms to showcase original creative content
- Enhancing the public workshops campaigns and discussion events for technology and environment.
- Promoting health events and social welfare
- Cooperating with the existed NGOs.
- Organizing workshops public talk.

The eco-friendly and green economy have to comprise the Successful business outcomes and attract industry and investment in smart sectors. The innovation ecosystem **consist of** the e-loan system, review and update the economic strategy for local innovation, promote eco-friendly economic, updating tourism sites and create new job application, developing innovation technologies that have less side effect on environment , inviting internal and external experts to analyze and evaluate the impact of the economic in the city, and conduct workshops. Resources requirements involve **c**ollaboration of government, stake holders and public, technicians and technology, labour, project managers, project teams, and investment of ideas, money, policy and procurement.

Discussion

Pros
- Value from city assets
- Improve efficiency of services
- Improve community engagement by involving people in the design of government services
- Improve business, innovation and investment
- Green economy
- Greener, cleaner and safer environment
- Better modern city infrastructure

Cons
- High-cost technology
- Need to protect local people from any infringement on their rights to land, natural resources and knowledge
- Aside from capital costs, it is also important that sufficient fund for operation and maintenance are made available and are annually including in MCDC's annually budget to ensure project sustainability.

To sustain the project

After this three years project, measurements on the effects, changes, pros and cons must be taken. Based on that result, the conclusion will be drawn what are priories and how to change the ways. The smart city implantation process will be carried on with these new conclusion, new finding, new idea and new changes.

CONCLUSION

Towards smart Mandalay implementation is actively seeking to harness the benefits of the digital revolution for our city. Our choice is to be proactive and choose the change that adds value to our region, increase our regional sustainability and drives new investment highly efficient services delivery, highly quality built environment within a decreasing revenue base through an international profile as a leading smart region. It is hoped that our proposal implementation will transform the city towards becoming a smarter and better Mandalay.

Acknowledgements

References:
1. Smart City Plan 2018-25:   Charles Sturt- A leading City
2. Smart City Implementation Program: Sunshine Coast Council
3. Smart City Strategy 2017-21:   Newcastle City Council
4. Citizen Driven Innovation-A Guidebook for City Mayor and Public Administrators, The World Bank and European network of Living Labs 2015
5. Future Workforce Trend in NSW: NSW Parliamentary Research Service 2025