MARIANO MARCOS STATE UNIVERSITY

Sustainable University Mobility Program

The university has established its **Sustainable University Mobility Program (SUMP)** that promotes sustainable transportation practices in reducing the university's carbon footprint, improving air quality, and a balanced environment for students, faculty, staff, and community through creative and dynamic sustainable health and well-being.

Specifically, the SUMP is geared towards the following: 1.Promote clean and sustainable transportation through the use of e-jeeps and e-bikes/e-scooters; 2. Encourage and promote the use of non-motorized transportation modes such as walking, biking, and other physical activities among key players and stakeholders; 3. Provide safe and accessible infrastructure for e-jeeps and non-motorized transportation modes on campus, including loading/unloading stations, bike racks, bike lanes, and covered walkways; 4. Increase awareness on sustainable transportation practices and balanced health and wellness interventions through campaigns and educational programs; and 5. Enhance appreciation of the Sustainable University Mobility Program through monitoring and impact assessments.

Several initiatives have already been in place such as: 1) use of e-jeeps and e-bikes/e-scooters; 2) the use of shuttle service; 2) car sharing; 3) carpooling; 4) use of gate passes; and 5) promotion of use of non-motorized transportation modes such as walking, biking, and other physical activities among key players and stakeholders.

1) **Shuttle service.** There are two shuttle services provided by MMSU to its faculty, staff, and students – the HINO bus and County (Rosa). The HINO bus has 49 seats and travels up north of Batac City (where MMSU is located) only (Batac, San Nicolas, and Laoag) while the County Rosa can accommodate 32 and travels down south of MMSU (Batac, Currimao, Pinili, and Badoc). The shuttle vehicles minimize the need for private transportation; in addition, it also gives a more affordable transportation option. The fare is only Php 20.00 ($ 0.34) per trip,

which is way lower than the fare collected by public utility buses and jeepneys which averages from Php 80 ($ 1.37) per trip.

2) **Car Sharing.** MMSU personnel who have vehicles are encouraged to 'share a car' with their colleagues. Through a memorandum order, the faculty, who are willing to 'share a car', identify specific times of the week where they pick up their colleagues or even students who are willing to join them as they report to work.
3) **Carpooling.** In order to decrease the number of private vehicles on campus, MMSU implements the carpooling scheme where personnel could use a university vehicle for free but by request. For example, one office could request a university vehicle to ferry the visitors of the university instead of asking them to bring their cars within the school premises.
4) **Issuance of Gate Passes.** MMSU limits the number of vehicles on campus through the issuance of gate passes as well. The gate pass system applies to both public utility vehicles and private vehicles. As a general rule, vehicles without gate passes are not allowed to enter the university.
5) Promotion of use of non-motorized transportation modes such as walking, biking, and other physical activities among key players and stakeholders.

Evidence:

- Sustainable University Mobility Program Proposal

SUSTAINABLE UNIVERSITY MOBILITY PROGRAM (SUMP)

A PROPOSAL

1. **BASIC INFORMATION**

Implementing Agency:	MARIANO MARCOS STATE UNIVERSITY (MMSU)
Proponent:	**Mariano Marcos State University** **SUM Program Committee** *University Health and Wellness Services* *Office of Student Affairs Services* *Planning Directorate* *Business Directorate* *College of Business, Economics and Accountancy - Department of Tourism and Hospitability Management* *College of Engineering* *College of Health Sciences* *College of Medicine* *National Bioenergy Research and Innovation Center*
Collaborating Agencies:	Commission on Higher Education (CHED) City Government of Batac, Ilocos Norte (CGBIN) Provincial Government of Ilocos Norte (PGIN) Department of Social Welfare & Development Department of Environment and Natural Resources Department of Health
Duration:	(Two years) 2024-2025
Sites/Locations:	MMSU Batac Campus
Target Beneficiaries:	MMSU Personnel (Faculty and Staff) Students Other stakeholders Residents Community Partners
Estimated Budgetary Requirement:	Php 20 Million

1. INTRODUCTION

1.1 Rationale

The Mariano Marcos State University (MMSU) plays a crucial role in shaping the future of local communities, people and society. As a driver of research and learning, it steers change and inspiring innovation in various aspects. One critical area where MMSU can significantly contribute is the mobility/transportation sector. By promoting sustainable mobility practices, MMSU can reduce its carbon footprint, improve air quality, and support the health and well-being of students, faculty, and staff including its university community partners.

Through a Sustainable University Health Mobility Program (SUHMP), the realization in bringing the best alternative solution to clean environment will be achieved through healthy and localized approach. The SUM Program is a comprehensive approach in promoting sustainable transportation practices on campus. It involves a range of policies, initiatives, interventions, infrastructure improvements, and incentives designed to encourage sustainable modes of transportation, such as biking, walking, and public transportation via e-jeeps while reducing reliance on fossil-fuel-powered vehicles. It is also addressing balanced initiatives combining health and wellness as well as natural aesthetics appreciation.

There are several compelling reasons why MMSU should invest in a Sustainable University Mobility Program. Firstly, transportation is one of the world's largest sources of greenhouse gas emissions. By promoting sustainable transportation practices, MMSU can reduce its carbon footprint and contribute to global efforts to mitigate climate change. This will help to protect the planet for future generations. This will also minimize air and noise pollutants regularly observed within the university premises, especially during peak hours and during big events that affect the entire environmental landscape.

Secondly, fossil-fuel-powered vehicles emit a range of pollutants that can harm human health and the environment. By promoting sustainable transportation practices, MMSU can improve air quality on campus and surrounding communities. This will help to create a healthier and more livable environment for everyone.

Thirdly, encouraging walking, biking, and other forms of active transportation can support the health and well-being of students, faculty, and staff. This can include reducing stress, improving physical fitness, and reducing the risk of chronic diseases such as obesity and heart disease. By investing in sustainable transportation options, MMSU can promote the health and well-being of its community members.

Fourthly, sustainable transportation practices can be more cost-effective than traditional transportation methods. For example, biking and walking require affordable investment in infrastructure and are free to use, while public transportation can be more affordable than owning and operating a car. MMSU can save money and promote sustainability by investing in sustainable transportation options.

Finally, MMSU has a unique opportunity to lead by example and demonstrate the potential of sustainable transportation practices to other institutions, universities, and the wider community. By implementing a Sustainable University Health Mobility Program, MMSU can

inspire others to act and contribute to broader efforts to create a more sustainable future. This will help to develop a culture of sustainability that will benefit everyone.

1.2 Goal:

To create a campus mobility system that is safe, accessible, efficient, and environmentally responsible.

1.3 Objectives:

General:

To promote sustainable transportation practices in reducing the university's carbon footprint, improve air quality, and balanced environment for students, faculty, staff, and community through creative and dynamic sustainable health and well-being.

Specific:

Specifically, the SUMP is geared toward the following:

1. Promote clean and sustainable transportation through the use of e-jeeps and e-bikes/e-scooters;
2. Encourage and promote the use of non-motorized transportation modes such as walking, biking, and other physical activities among key players and stakeholders;
3. Provide safe and accessible infrastructure for e-jeeps and non-motorized transportation modes on campus, including loading/unloading stations, bike racks, bike lanes, and covered walkways;
4. Increase awareness on sustainable transportation practices and balanced health and wellness interventions through campaigns and educational programs; and
5. Enhance appreciation of the Sustainable University Mobility Program through monitoring and impact assessments.

1.4 Expected Outputs and Outcomes:

Outputs:

1. Enhanced sustainable environmental culture on safety, responsiveness and health through mobility interventions
2. Increased availability and accessibility of non-motorized transportation infrastructure, such as bike racks, bike lanes, and pedestrian walkways;
2. Increased availability of electric vehicles for university use;
3. Increased use of non-motorized transportation modes among students, faculty, and staff; and
4. Increased awareness and knowledge among the MMSU community about the benefits of sustainable transportation practices.

Desired Outcome:

Healthy, walkable, environment friendly university for its key players, stakeholders, clientele, and community

a) Free from greenhouse gas emissions, air and noise pollution from university transportation
b) Quality air on campus and surrounding communities
c) Healthy well-being of students, faculty, and staff
d) Strong leadership and influence in promoting sustainable transportation practices and healthy landscape

1.5. Impact

The Sustainable University Health Mobility (SUHM) Program is envisaged to promote a healthy workplace, improved physical fitness and well-being of students, faculty, and staff, resulting in cost savings for the university from reduced transportation expenses, creating a sustainable culture for the environment within the MMSU community, encouraging students, faculty, and staff to utilize, apply and adopt sustainable practices beyond the campus, and demonstrate leadership while promoting and inspiring other institutions and communities to act and contribute to the overall efforts on safe, clean and balanced environmental landscape.

II. IMPLEMENTATION STRATEGIES

2.1 Conceptual Framework

The Program is guided by a Systems model, as shown in Figure 1. It presents the needed interventions and resources in implementing the plans, programs, projects and activities through multi-pronged modalities and strategies. It is focused on a shared responsibility by the university community and its stakeholders in a holistic manner.

Figure 1. Conceptual Framework of the Program.

2.2 The SUMP Committee

The Program shall be rolled out by assigning a committee to manage the Program's overall implementation with the support of the MMSU Administration and other support systems.

Chair: General Services Directorate
Co-Chair: *Office of Student Affairs Services*
Members:

Planning Directorate
University Health and Wellness Services College of Health Sciences
Business Directorate
College of Business, Economics and Accountancy
College of Engineering
College of Medicine
National Bioenergy Research and Innovation Center

Specific roles and responsibilities will be determined based on the contribution of the different support units and entities implementing, monitoring, and evaluating the different activities. Also, the committee will be tapped for collegial and institutional projects supportive to the operation in instruction, research, and even extension activities on the ground for both students and faculty-researchers as well as prospective partners.

2.3 Program Components

The Program encompasses four major components to achieve the desired outputs and outcomes, as shown in Figure 2.

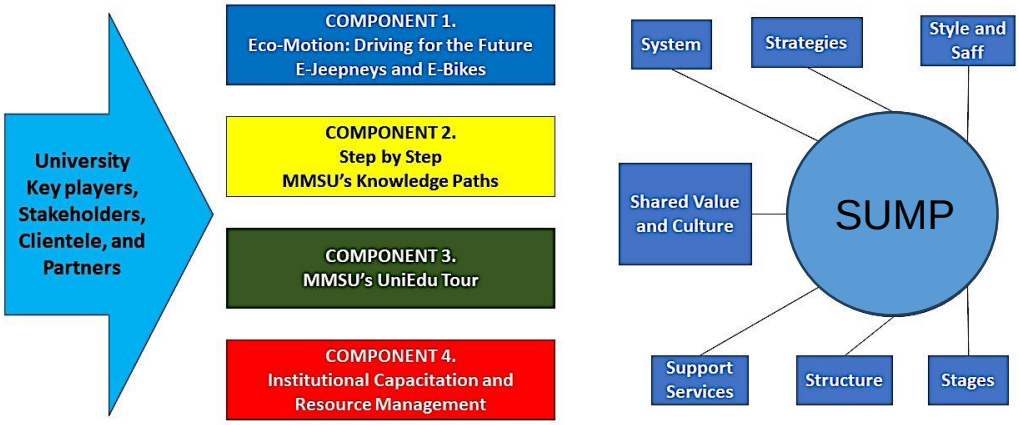

Figure 2. Components of the Program

A. COMPONENT 1: Eco-Motion: Driving for the Future (Advancing Clean and Healthy Integrated Electric Vehicle Experience at MMSU)

A.1 E-Jeepney

Introduction

The use of e-jeeps in the Philippines is primarily driven by the need to address several pressing issues in the country. These include: (1) environmental concerns, (2) health concerns, and (3) modernization of public transport.

The Philippines is one of the countries which is most vulnerable to the impacts of climate change. As such, the government has been promoting the use of cleaner and more sustainable modes of transportation to reduce the country's carbon footprint. E-jeeps, being electric vehicles, produce zero emissions, making them an attractive alternative to traditional jeepneys that run on fossil fuels.

Traditional jeepneys in the Philippines are known for their high levels of air pollution, which can have negative health impacts on both drivers and passengers. E-jeeps, on the other hand, are emission-free and can help improve air quality in urban areas. Traditional jeepneys are a common mode of public transport in the Philippines, but they are also known for their outdated and often unsafe designs. E-jeeps are equipped with modern safety features and amenities, such as air-conditioning and GPS tracking, making them a safer and more comfortable option for passengers.

Objective

To establish and maintain an electric vehicle fleet (e-jeeps) with an e-payment system for university constituents and tourism use.

Figure 3. E-jeep Concept

Budget Requirement: **Php 1 - 1.5 million/unit**

Quantity: **6-8 units**

Additional Accessories: **Charging Equipment / Station and Parking Infrastructure**
Option: Solar Charging Station (Grid-tied)

E-Jeepney Technical Requirements

- **Power Source:** The power source should be an electric motor powered by rechargeable batteries
- **Range:** The range of the e-jeep can vary depending on the capacity of its battery and driving conditions. It can typically travel between 80-120 kilometers on a single charge.
- **Seating Capacity:** Depending on the size and design of the e-jeep, it can have a seating capacity of 18 passengers.
- **Dimensions:** The dimensions of the e-jeep can vary depending on the manufacturer and model, but they are typically between 4-6 meters long, 1.5-2 meters wide, and 2-3 meters high.
- **Speed:** The e-jeeps can typically reach a maximum speed of 40-60 kilometers per hour.
- **Charging Time:** The charging time of the e-jeep can vary depending on the type of charger and battery capacity, but it can take anywhere from 4-8 hours for it to fully charge.
- **Features:** The e-jeeps are equipped with audio systems, and LED lighting. E-jeeps should also be equipped with safety features such as seat belts, speed governors, and rearview cameras.

Operation

Drivers**:** A driver/s should be designated for the e-jeeps. The driver is responsible for maintaining and ensuring the smooth operation of the vehicle. The qualifications and required training program for the driver/s are listed below.

E-Jeep Driver Qualifications:

- Familiar with school's traffic rules and regulations
- Adequate experience in driving similar vehicles
- Good communication and customer service skills

Training Program for E-Jeep Drivers:

- Orientation on e-jeep features, controls, and safety protocols
- Training on energy-efficient driving techniques
- Customer service training to ensure a pleasant passenger experience
- Regular refresher courses on vehicle maintenance and troubleshooting

Fare: The proposed fare for riding the e-jeeps will be set at Php 10.00. It will be utilized for the operation, maintenance, management, and improvement of the e-jeeps.

Route: The e-jeeps will operate on two (2) routes, namely, the east line and the west line to ensure better mobility inside the campus

Cost and Return Analysis

Table 1: Cost and Return Analysis of E-Jeep

Capital Investment	
E-Jeepneys	10,000,000.00
Charging Stations	750,000.00
Total Investment	10,750,000.00
Income	
Fare (Php. 10.00/student)	3,840,000.00
Expenses	
Salary of Drivers (Php. 500.00/day)	800,000.00
Repairs	500,000.00
Miscellaneous	
Battery	50,000.00
Total Expenses	1,350,000.00
Net Income	2,490,000.00
Payback Period	**4.32 years**
ROI	**23.16%**

Table 1 presents the Cost and Return Analysis of the E-jeep. The initial investment for the e-jeeps is projected at 10.75 million pesos. A total of 8 e-jeeps will be procured at 1.5 million/e-jeep, and 5 charging stations will be placed on strategic locations amounting to 150k/charging station.

The projected annual income for operating the e-jeep is 3.84 million pesos. The fare for riding the e-jeep is set at 10 pesos, with an average of 10 students/trip at 3 trips/hour. The e-jeeps will operate for 8 hours/day in 200 school days/year. The annual expense includes the salary of drivers, repairs and maintenance, and battery replacement (3-5 years useful life at 150k/battery) for a total of 1.35 million pesos. The payback period for the e-jeeps is computed at 4.32 years with a Return on Investment (ROI) of 23.16%

Proposed E-Jeepney Route

There are two e-jeepney routes to be implemented to support the different units and campus direction for sustainable mobility, namely: East Line to cover the colleges and units on the east side of the Administration Building and Twin Gates and the other is West Route to cover the west side. The routes will ferry faculty and staff, students, and other clientele/partners going from one building to the other. The routes will be supported by e-Jeepneys on an eight to ten-minute interval or less.

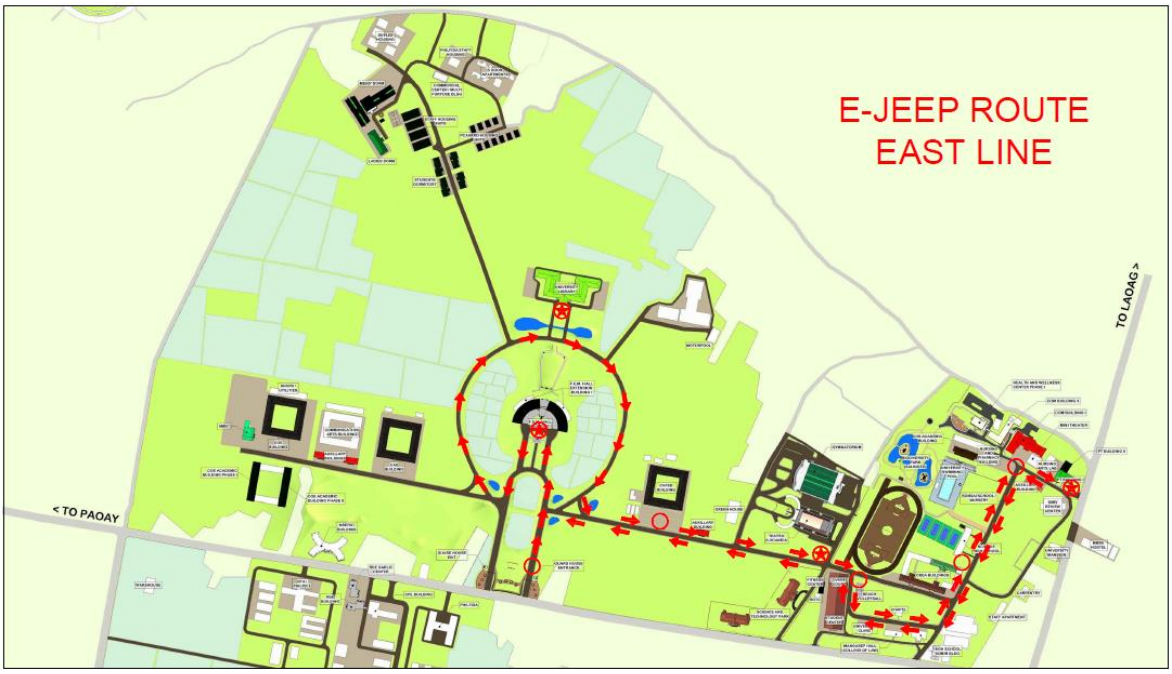

Figure 4. proposed e-jeepney route

Maintenance

Vehicle Maintenance and Inspection

- Regular inspection and maintenance of e-jeeps should be done to ensure optimal performance and safety
- Conduct preventive maintenance checks, including battery health, brakes, tires, and electrical systems
- Schedule routine servicing and repairs to minimize downtime
- Maintain comprehensive maintenance records for each e-jeep

Management

Operational Efficiency and Monitoring

- Implement a central management system to track e-jeep operations and performance
- Monitor vehicle routes, passenger loads, and operational efficiency
- Collect data on energy consumption, emissions, and cost savings
- Analyze data to identify areas for improvement and optimize operations

Charging Infrastructure and Management

- Establish sufficient charging stations strategically located within the university campus
- Regularly monitor and maintain charging infrastructure for reliability and efficiency
- Implement a scheduling system to manage e-jeep charging and minimize wait times
- Provide real-time charging status information to drivers and management

User Feedback and Grievance Mechanism

- Establish a feedback mechanism for passengers to provide comments, suggestions, and complaints
- Respond promptly to passenger feedback and address grievances in a timely manner
- Use feedback to improve service quality and address any operational issues

A.2 Stallion Utility Bicycles (Stallion UniBikes) Description

The SUB project aims to provide students, staff, and faculty members with an affordable, convenient, and environmentally friendly mode of transportation on campus. It also aims to increase active commuting by all stakeholders over 20% upon implementation.

The SUB project promotes sustainable transportation options. By encouraging the use of bikes instead of cars or other motorized vehicles, it helps reduce carbon emissions and environmental pollution. This project promotes sustainable transportation options and aligns with the university's commitment to environmental stewardship and contributes to its sustainability goals.

This project also enables our stakeholders to engage in regular physical activity as they travel around the campus. Regular cycling can improve cardiovascular health, enhance mental well-being, and reduce stress levels, contributing to a healthier university community. SUB shall foster cost-effective transportation as well since owning and maintaining a personal vehicle can be expensive for students, particularly those on tight budgets. The SUB project provides an affordable alternative for transportation within the campus. By offering bike rentals at a reasonable cost, it reduces the financial burden on students and encourages them to choose a cost-effective mode of transportation.

The mode of management for the SUB project is through outsourcing where monitoring, and other tasks and processes are delegated to third-party service providers.

Budget Requirement: **Php 10,000.00 - Php 12,000.00/unit**

Quantity: **70-100 units**

Additional Accessories: **Bike racks, Monitoring equipment**

Figure 5. Concept Charging Stations and Parking Areas

B. COMPONENT 2. STEP BY STEP: MMSU KNOWLEDGE PATHS

Introduction

We propose a comprehensive initiative, guided by the motto "Step by Step: MMSU Knowledge Paths," to transform our university into a walkable campus. This initiative aims to create a vibrant, interconnected network of covered walkways, fostering a sustainable and eco-friendly environment while nurturing a culture of learning and community.

Objectives: The primary objectives of this component are as follows:

1. Improve campus accessibility by providing covered walkways that create seamless "knowledge paths" between key buildings, facilities, and points of interest; and
2. Ensure the safety and comfort of students, faculty, and staff as they traverse the campus by providing shelter from adverse weather conditions along these "knowledge paths."

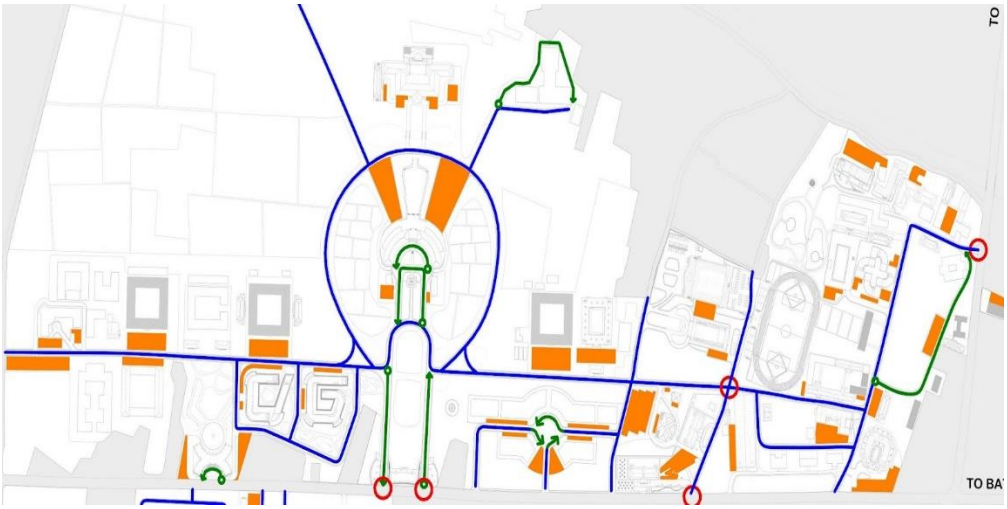

Figure 6. Proposed walkways

Proposed Activities:

1. **Refurbishment and Painting of Existing Covered Walkways.**
2. **Construction of New Additional Covered Walkways.**

    a) Repaint all roofs of walkways situated along the road with **maroon**; **green** for roofs of walkways going to College buildings.

Figure 7.

b) Walkway from gate 1 to the new COM building to include side of CHS building. Relocate the entrance of students on the left side rather than the right side of Gate 1.

Figure 8.

Figure 9.

3. Walkways in the High school, CBEA, College of Law, Student Center, Covered Court, MMSU oval and outside campus

    a) High school walkway – for repair and repaint roof with green
    b) CBEA walkway – extend the existing walkway for it to be nearer the walkways situated at the main road
    c) College of Law and Student Center – create a new walkway with roofing situated on the left side of road facing west in front of the College of Law and Student Center.
    d) MMSU oval – Create a new walkway with roofing on the left side of road facing west from MMSU oval to Covered court

e) Outside campus – Create a new walkway with roofing on the left side facing south over the canals just outside of the campus, located from the gymnatorium to the crossing of Bacucang road and Marcos Avenue

Figure 10.

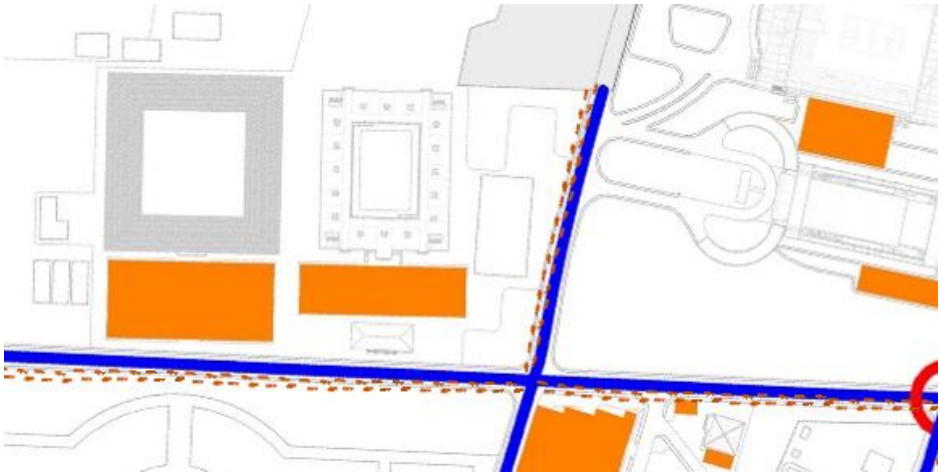

Figure 11.

4. Extend walkways at the side of Teatro Ilocandia from the guard house to the next guard house; add roofings on the existing walkway in front of Teatro ilocandia.

Figure 12.

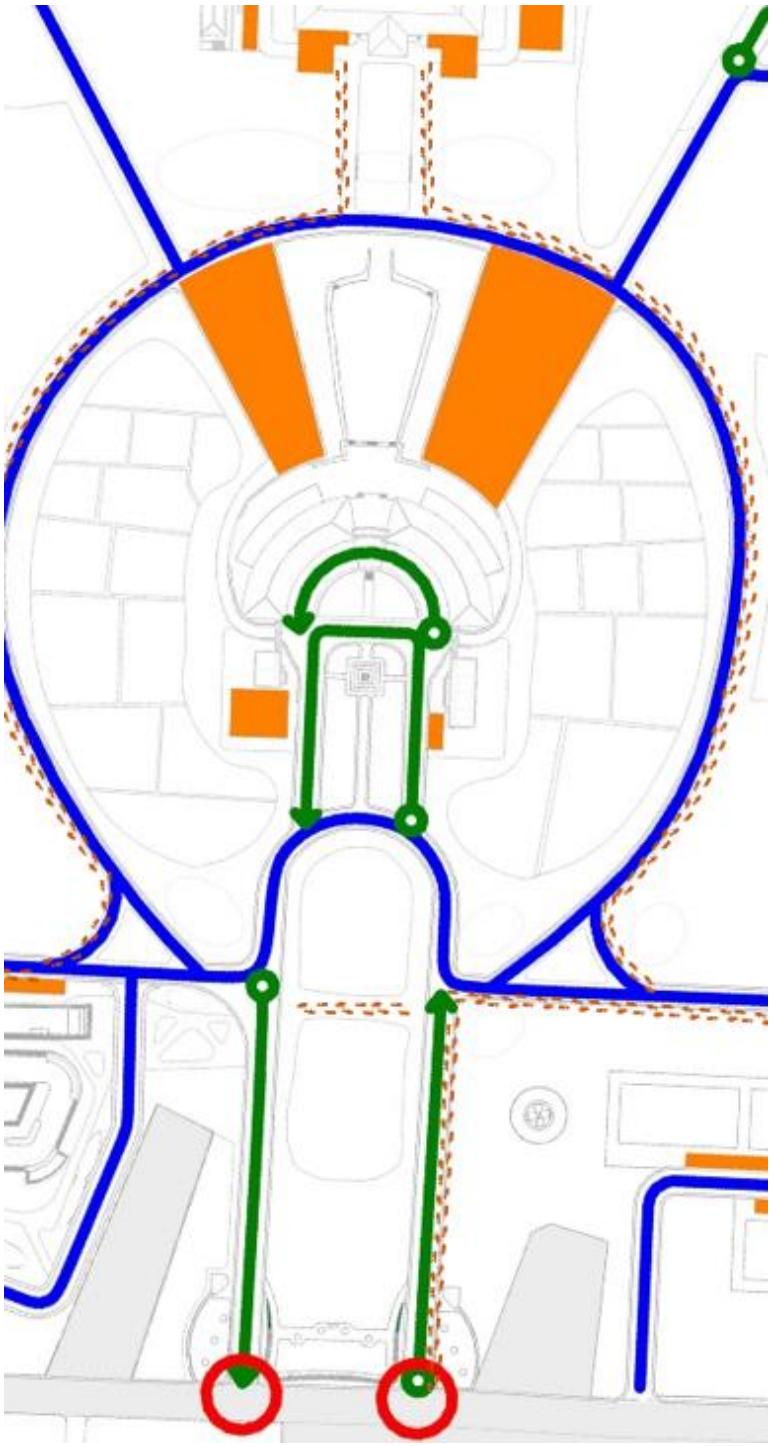

Figure 13.

a) Create a new walkway with roofing from the curve street to the bridge going to the library on both east and west side
b) Create a new walkway with roofing from the main entrance of MMSU to main Highway (Marcos Avenue) with roofing
c) Repair the cemented walkway w/o roofing located in front of the Administrative building

Figure 14.

Figure 15.

5. Extension of the existing walkway with roofing from CAS to the new buildings of COE

Note: Take into consideration location of walkways to maintain existing parking areas

Figure 16.

Budget:

The estimated budget for this project is Php 6,000,000.00 encompassing materials, labor, lighting installation, and contingencies.

C. COMPONENT 3. MMSU UniEDU Tours

This component supports the university education tours developed by the team of the CBEA-DTHM. I have shared the university tourism routes to be enhanced to have a comprehensive plan. Kindly check the details. Kindly refer to the shared documents sent to our GC. Thanks.

The University Tourism Routes (The University TOURS) is a project that promotes the University as a tourism destination. The MMSU tourism experience is made up of the colleges, units and projects as primary attractions and other resources serve as supporting facilities. Various sights and sites are complemented by interactive activities.

The creation or design of tour packages is an existing academic activity of the BS Tourism Management program of the university. Students guided by faculty members are assigned to manage university guests or groups to tour around the campus and province. This has long been the practice of the program to train its students and realize their potential in different areas of tourism and hospitality (e.g., travel agency, tour operations, tour guiding, events management).

E-jeeps and bicycles would be a great partner in creating the MMSU tourism experience. E-jeeps may also serve as an attraction or catchment facility to students, faculty members and all other visitors. Bicycles, in addition, are a healthy option to tour around the campus. E-jeeps and bicycles may serve as pull and push factors for MMSU as a tourism destination.

D. COMPONENT 4. Institutional Capacitation and Resource Management

This will cover both the physical and infrastructure support requirement of the project. There is a need to identify what needs to be included as part of the overall initiative of the university. This will include information campaign/awareness of the sustainable university health mobility intervention to be implemented, training support for faculty-members to use this as part of their research and extension projects if it will be properly coordinated with appropriate units to support this initiative. Finally, make sure that it serves as teaching-learning initiative to support students learn actual experiences related to their areas of interest.

3.0 IMPLEMENTING STRATEGIES *(to be described in detail and discussed to support the components)*

Identify strategies to ensure quality, efficiency, and effectiveness in the smooth implementation of the program/project, implementing guidelines, and policies shall be prepared by the SUHMP Committee.

3.1 Work Plan

DETAILS	*TARGETS*	*Y1*	*Y2*	*Y3*	*INVOLVED STAFF*	*RESOURCE REQUIREMENT*
Project Coordination and Management (including M&E activities)						
Component 1						
Component 2						
Component 3						
Component 4						

3.2 SUMMARY OF FINANCIAL REQUIREMENTS

PARTICULARS	**DETAILS**	**AMOUNT**
Personal Services (PS) • Administrative Staff (Clerk) • Project Staff to assist RDE activities • Student guides • E-jeep drivers • Mechanic/Technician		1,000,000.00
Maintenance and Other Operating Expenses (MOOE) • Supplies and Materials • Communication • Training Expenses • Professional Fees • Misc./Contingencies		1,000,000.00
Capital Outlay • 8 units e-jeep/RFID Capable • 5 Waiting Sheds • 2 Garage with Charging stations • Camera with complete accessories • Computer Desktop with complete accessories • Office Equipment (for the Travel Bureau) • Others		18,000,000.00
Total		**20,000,000.00**