



Student Engagement: The Key Role of Sustainable Transportation at KMUTT Thailand

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Abstract. King Mongkut's University of Technology Thonburi (KMUTT) committed to be Sustainable University for SDGs 2030 since 2017 and committed to sustainability leadership in all our activities from operations, teaching, to conducting research. Our commitments are to be a sustainable university providing a role model on Energy, Environment, Safety Management Systems and provide sustainability platform to promote sustainability leadership. Sustainable transportation system has been provided by top management policy since 2018 which focus on walk and bike society with zero emission vehicles, free shuttle bus and free bicycle services. In KMUTT, Student engagement is a key role to achieve the sustainable transportation goal which comply to SDG 3: Good Health and Well-being; SDG 7: Affordable and Clean Energy; SDG 11: Sustainable cities and communities and SDG13: Climate Action. KMUTT Green Heart is student's sustainability leadership team who interested in environmental sustainability which make university and communities surrounded more green and better quality of life and create their own activities to serve sustainable transportation activities for all in KMUTT by using SEP for SDG concept. Moreover, KMUTT initiate sustainable strategy which provide the learning environment to make all campus as living lab, promote people participation and monitoring to make continual improvement with positive reinforcement. The sustainable transportation goal achieved along with the expansion activities to community surround according to the student engagement.

Keywords: Sustainable Transportation, Student Engagement, Walk and Bike Society, Zero Emission Vehicles, SDG3, SDG 7, SDG11, SDG 13

1. Introduction

King Mongkut's University of Technology Thonburi (KMUTT) is one of Science and Technology university in Thailand which committed to be sustainable university comply the global and national sustainable agenda based on goals of SDGs 2030. Sustainability is one of the major challenges of current and future generation of students & staff in KMUTT. To achieve the sustainability goals, KMUTT focus on student engagement and determines to

develop education, research, and social services based on SDGs 2030 in producing green-hearted students who will become the social change agents apply their knowledge and skills to create an impact at societal, national, and global levels. Sustainable transportation is one of our sustainable goals which play an important role in carbon emission and pollutant levels in universities. Sustainable transportation system in KMUTT has been provided by top management policy since 2018 focus on walk and bike society with zero emission vehicles, limit the number of motor vehicles on campus, free clean energy shuttle bus, free bicycle services, pedestrian promotion which encourage a healthier environment for students and staff to walk around campus. To ensure access the sustainable transportation, KMUTT concerns to develop walk and bike society with zero carbon emission vehicles, promote the use of universal pedestrian around the campus and provide the walk and bike policy, motor vehicle limitation policy and declare the mission to eliminate its carbon emission to zero within 2040 in the “KMUTT Carbon Neutrality 2040” campaign including the sustainable mobility in campus. KMUTT has been educated our students and encouraged them to learn outside classroom and transform our campuses as “living lab” to be an ideal for developing awareness and innovative solutions to relevant problems that will improve the world for current and future generations .KMUTT develop living lab for sustainable transportation by using Green society as bicycle centre for walk and bike living lab and free EV vehicle centre for EV vehicle living lab which more than 500 students join and create their activities each year. To achieve the sustainable transportation goal which comply to SDG 3: Good Health and Well-being; SDG 7: Affordable and Clean Energy; SDG 11: Sustainable cities and communities and SDG13: Climate Action, more than 500 KMUTT Green Heart students play their role on sustainable transportation by promoting walk and bike society and zero emission vehicles usage in campus and create more than 50 walk and bike activities each year within campus and expand to communities which make university and communities surrounded more green and better quality of life. The purpose of this study is to share our experience on sustainable transportation in KMUTT with student engagement as a key role for sustainability.

2. Points of Results and Discussions

KMUTT is one of Sustainable university which committed to achieve SDGs 2030 goal by using SEP for SDG concept.To achieve the Sustainable transportation goals, KMUTT has been provided by top management policy since 2018 focus on walk and bike society with zero emission vehicles, limit the number of motor vehicles on campus, free clean energy shuttle bus, free bicycle services, pedestrian promotion which encourage a healthier environment for students and staff to walk around campus.

2.1. Sustainable Transportation policy

KMUTT transportation policy has been launched since 2010 and run one of the most comprehensive programs to reduce university-related traffic impacts which is an essential part of our drive for sustainability. The transportation policy has been implemented within our university since 2011and focus on Walk and Bike Society Policy since 2018 as shown in **Figure 1**. KMUTT has committed to support Walk & Bike Society within campuses by support infrastructure and Master plan for walk & bike lane within campus, built environment to promote Walk & Bike Society within campuses and surround communities, support walk &

bike activities and promote walk & bike network with surround communities and encourage our students and colleagues to become change agents for helping the community and society save energy, healthy and have a better quality of life.



Figure 1. Sustainable transportation policy in KMUTT: KMUTT Walk and Bike Society Policy has been launched since 2018

2.2. Support infrastructure and Master plan for walk & bike lane within campus : KMUTT Walk and Bike Master Plan

According to KMUTT Transportation policy which promote Walk & Bike Society within our campus. KMUTT is committed to support infrastructures and system and built environment to transform our campus as Living lab for Sustainable transportation. KMUTT Walk & Bike Master plan has been launched and provide Bike Lane, Building Access, Bike Parking Area, Bike Repairing Centre & Bike Café. Detailed design for all in Master plan is now in the step of ongoing process. Existing bike lane and bike parking master plan are shown in **Figure 2**.



Figure 2. KMUTT Walk and Bike Master plan show Bicycle Lane and Bicycle Station

To support walking campus, KMUTT provide green and universal pedestrian path around the campus and promote student and staff to walk for health along with the green tree shading to support KMUTT carbon neutrality campaign. The pedestrian path in campus is shown in **Figure 3**.



Figure 3. The pedestrian path which supports walking campus in KMUTT

2.3. Built Environment to promote Walk & Bike Society within campuses and surround communities

2.3.1 Promote Bike Share services in KMUTT

KMUTT operate Bike Share services with free of charge and provide bicycle repairing centre for repairing and maintenance services. Green heart students from KMUTT Green bike club play a role to involve and handle Bike share services activities. Moreover, they add more green and funny activity in the theme of Recycle to Cycle Campaign which promote the students and staff to concern on recycle aluminium can and drinking water bottle. This Recycle to Cycle Campaign need our student and staff who want to use bicycle sharing service, must deposited aluminium can and drinking water bottle for redeem points and use the deposited point for using bicycle sharing service in our university with some complimentary as shown in **Figure 4**. KMUTT Bike share service is not only the place for sharing bicycle for riding in our campus and community surround, but also can help our

student and staff to learn and understanding our recycle system by using bicycle riding with funny and happy activities. KMUTT set target for 50% of bicycle usage increasing to serve walk and bike society by 2024 compared to 2010 baseline. The results in 2022 showed 45% increasing in bicycle usage and more than 2,915 students joining KMUTT Green Bike Club with 20,146 bicycle usage per year.



Figure 4. Recycle to Cycle campaign to promote bike sharing in KMUTT

2.3.2 Support walk & bike activities and promote walk & bike network with surround communities

KMUTT support walk and bike activities in campus by using student engagement from KMUTT Green Bike club which is one part of KMUTT Green Heart student. KMUTT Green Bike Club is one of KMUTT student club which are informal formed since 2005 with a passion for cycling and actively promotes creative solutions to environmentally challenging issues and health promotion. The club has been formal launched since 2013 with 225 members. All members of the University community including students, staff and alumni are eligible for club membership by invited and encouraged to participate in all club activities. Their activities are mainly in community projects and environmental conservation. The results from 2013 to 2022 showed 8,211 KMUTT students and alumni join Green Bike Club as a member. In 2022, they initiate more than 50 bicycle riding activities including Bike Friday, Saturday Ride Fever, KMUTT Bangmod-Bangkhunthien Traditional bike trip, Car Free day, Bangkok-Huahin Long bicycle Trip, Bangmod-Rachaburi Bicycle Trip which 7,114 people joined their activities. Bike activities by student Green heart from KMUTT Green bike club are shown in Figure 5.



Figure 5. Bike activities by Student Green Heart from KMUTT Green Bike Club

2.4. Zero emission vehicle promotion and clean energy shuttle bus for Carpooling in KMUTT

According to KMUTT transportation policy, the limit on both private vehicle driving and parking area have been implemented since 2015. KMUTT offer additional transportation services including bicycle services by using bike share for free of charge with parking, repair and maintenance facilities and provide public transport, carpooling by using clean energy and EV shuttle bus with free of charge. But the requirement for private car usage still left for some staff. For this reason, more than 17 conventional car parking area around campus are cancelled and replace with vertical car parking facility where provide more parking in less space (470 cars). These have been done to ensure a modal shift from private car to sustainable transportations such as zero emission bus and van services for free of charge along with walk and bike promotion in campus for better quality of life and good health for all. KMUTT aims to be zero emission campus with carbon neutrality campaign by initiating a sustainable transportation policy, and sustainable transportation route master plan to limit the use of private car with carpooling by using zero emission vehicle such as EV carpooling and EV shuttle bus. In support of carbon emission reduction, KMUTT announce the declaration of Intent “KMUTT’s race to carbon neutrality by 2040” with sustainable transportation by using clean energy transportation and EV car usage for carpooling, shuttle bus and other transportation. These have been done for GHGs emissions reduction, fuel costs reduction with more environmentally friendly along with traffic congestion and parking spaces reduction. In 2022, KMUTT use 100% EV shuttle bus for Bangmod -Bangkhunthien -KX campus, use NGV shuttle bus and van for Bangmod -Bangkhunthien campus with 3 locations for EV car charger ,1 location for EV motorcycle charger with Hop on-Off EV bus as some shown in **Figure 6**. For carbon footprint calculation, KMUTT follow the Scope 3 carbon emission which calculated from Electrical usage per year, Transportation per year and open space area per total people. In 2022, the KMUTT carbon footprint per year was 18,080.61408 tons with zero emission from shuttle bus ,47.339 tons from car and 20.335 tons from motorcycle as shown in **Figure 7**.



Figure 6. KMUTT Carbon Neutrality 2040 declaration and pathway to achieve the goal with sustainable transportation by using clean energy transportation and EV carpooling, shuttle bus and van

Carbon Footprint Per Year	
Electricity Usage Per Year	18,012.9394
Transportation Per Year	
- Bus	0
- Car	47.339
- Motorcycle	20.335
Carbon Footprint Per Year	18,080.61408 ton

Figure 7. KMUTT Carbon footprint per year in 2022

3. Summary/ Concluding Remarks

The purpose of this study is to share our experience on sustainable transportation management in KMUTT which focus on Walk and Bike society , carpooling by using clean energy and EV shuttle bus along with the “KMUTT Carbon Neutrality 2040” campaign to support carbon emission reduction .Sustainable transportation has been promoted and supported on infrastructure with walk and bike master plan, sustainability learning environment to make all campus as living lab, promote people participation and monitoring to make continual improvement with positive reinforcement. Sustainable transportation activities have been promoting and supported by student Green Heart which is student’s sustainability leadership team who create their activities to serve sustainable transportation activities for all in KMUTT by using SEP for SDG concept and comply to SDG 3, SDG 7, SDG 11 and SDG13. The results achieved along with environmentally friendly, healthy promotion and carbon emissions reduction within university and community surrounded according to the student engagement.

References

- [1] KMUTT, *Strategic Plan 2018-2024* (2018). Available online at <http://sustainable.kmutt.ac.th>, accessed on 17 April 2023
- [2] KMUTT, *Transportation*, KMUTT Office of Sustainability (2022). Available online at <http://sustainable.kmutt.ac.th>, accessed on 17 April 2023
- [3] KMUTT, *KMUTT Carbon Neutrality 2040* (2021) Available online at <https://www.kmutt.ac.th/en/sdgs-en/kmutt-climate-action-en/carbon-neutrality-by-2040/> accessed on 17 April 2023



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