

# 1A3B Road Transportation

GHG mitigation options	Management / System		Energy efficiency
<b>Target (CO2 reduction)</b>	Reduce travelling demand and time consuming and congestion	Cost reduction	Maximize efficiency
<b>Drivers</b>	Demand and market-driven, minimized traveling time		Fuel economy standard and emission control
<b>Capacity gap and barrier</b>	Law and regulation, lack of urban planning	lack of network infrastructure and pricing incentive	High stock of inefficient vehicle
<b>Technology options and Research questions</b>	<p><b>Smart mobility and management</b></p> <p><b>Long-term</b> Smart city,</p> <p><b>Short-term</b> Autonomous vehicle, Integration of IT (เทคโนโลยีที่นำมาใช้) / Electronics / Vehicle / Energy, Sharing of car/riding</p> <p><b>Current</b> GPS tracking, Traffic light control</p> <p><b>Research questions</b> - How to minimize travelling demand, shorten time travel with better quality of life</p>	<p><b>Mode shift</b></p> <p><b>Long-term</b> Interconnected high speed train, complete network of heavy-light rail + BRT</p> <p><b>Short-term</b> - Network system on heavy and light rail, BRT, Tram BUS in outer BKK - Non-motorized options, eg. bicycles and etc.</p> <p><b>Current</b> Separate systems of Heavy rail in BKK, BRT, ordinary bus</p> <p><b>Research questions</b> - What is pricing mechanism and policy support for mode shift - How to manage and operate existing and future mass transit project efficiently - How to change behavior of passengers to take public transport and non-motorized transportation</p>	<p><b>Internal combustion engine (ICE)</b></p> <p><b>Long-term</b> - Turbo-compound (mechanical/electric) - Bottoming cycles/waste heat recovery (e.g. organic Rankine)</p> <p><b>Short-term</b> Advance turbo charge, Reduce mechanical and heat loss, Heat recovery</p> <p><b>Current</b> - ICE turbo charging - Advanced gasoline engine</p> <p><b>Research questions</b> - How to improve overall efficiency and tailpipe emission - How to design low friction body, lighter materials, and improve aerodynamics</p>
<b>Current technology support</b>	<p><b>Smart mobility and management</b> - ENCON fund, TRF, NRCT: R&amp;D funding</p>	<p><b>Mode shift</b> - Technology transfer on power train and high speed train</p>	<p><b>ICE</b> - Thailand Automotive Institutes (TAI): Support and co-ordinate R&amp;D activities and policy direction - The Thai Automotive Industry Association (TAIA): Support and co-ordinate activities for private sector - ENCON fund, TRF, NRCT: R&amp;D funding</p>
<b>Resources</b>	<p><b>Policy and regulation:</b> - Make clear policy and appropriated actions for urban planning and massive transportation. - Change philosophy to give priority to non-motorized options. - Promote domestic industries related to new innovative products in mobility, vehicle and energy businesses, e.g. parts of EV, batteries and etc by provide privilagees, e.g. tax incentives, BOI and etc for domestic firms and new start-up with in-house R&amp;D</p>	<p><b>Institution:</b> - Strengthen capability of the exiting institute/association, e.g. TAI, EVATand expand their function for technical service and R&amp;D activities - Set up centers of excellences for government agencies and research universities in each single technology, and linkage with the industries.</p>	<p><b>Capacity building:</b> - Strengthen international relations and research network to enhance R&amp;D activities, e.g. training, exchange programmes, research projects and etc at all level. - Develop accessible database for experts, publications, patents and intellectual</p>
<b>References</b>	<p><b>Smart mobility and Battery</b></p> <p>MTEC - Energy Storage (Presented by Dr. Pimpa 2016)</p> <p>IRENA - RE and Storage roadmap (2015)</p> <p>IEA - Energy Technology Perspectives 2016</p>		<p><b>ICE</b></p> <p>IEA - Energy Technology Perspectives</p> <p>IEA - Fuel Economy of Road Vehicles</p>