


**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
BRT-1A	Bus Rapid Transit	<b>Phase 1A BRT Green Line and Blue Line Construction and Implementation</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Project Cost</b>	<b>7) Term</b>
YCDC		April 2014 to August 2016	Approximately US\$153.0M	Immediate /short term
<b>8) Background/Current Issues</b>				
<ul style="list-style-type: none"> <li>- Developing an early BRT network is critical to retaining public transport market share</li> <li>- A BRT system addresses many of the existing bus service problems and creates a more sustainable business model.</li> <li>- Close coordination and consultation with affected operators (those displaced by new routes) will require support and involvement of Matata.</li> </ul>				
<b>9) Project Outline</b>				
<ul style="list-style-type: none"> <li>- To construct <b>Phase 1A Blue Line and Green Line</b> totalling <b>49.9 Km</b> of BRT busway and BRT stations</li> <li>- To establish a BRT Agency and BRT Control Centre</li> <li>- To implement a synchronised intersection control along the two busway corridors.</li> <li>- To install an integrated fare collection and smart-card E-ticketing system</li> <li>- To establish BRT operating companies to provide bus services to the system under performance-based contract.</li> <li>- Acquire bus fleet of <b>110 bi-articulated CNG buses</b> and build 1 main bus depot and one sub-depot.</li> <li>- <b>Implement BRT routes 1,2,3.</b></li> </ul>				
<b>10) Expected Project Effect</b>				
To improve public transport along two intersecting BRT lines to create an initial public transport network and an East-West corridor.				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
YCDC to establish Project Management Unit (PMU) to manage project and establish BRT Agency as network manager.				
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Project Cost</b>	
a) Concept and Feasibility Study to Basic Design Stage: 3 months from April to June 2014 b) Upon Approval: Detailed Design, Tender Document Preparation: 6 months from August 2014 to January 2015. c) Tendering: 3 months from Feb 2015 to April 2015 d) Construction, Procurement, Installation 12 months from August 2015 to July 2016 e) Service Development and Commissioning Project 12 months from Sept. 2015 to August 2016. <b>Commencement of Service: August 2016</b>			Infrastructure @ US\$ 1.864 Mill. per km including busway, stations and ITS/ traffic systems. <b>Total US\$93.0M</b> Bus Fleet Cost at US\$ 480,000 per bus <b>Total US\$52.8M</b> Main bus depot and one sub-depot with CNG filling stations. <b>Total US\$ 7.0M</b> Control Centre <b>Total US\$ 0.3M</b>	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
The city benefits from an efficient mass transit network with the removal of old buses along these corridors. Passengers benefit from a high quality service and bus operators benefit from a more sustainable business model. The transport system in Yangon will be more energy and emissions efficient and provides a good alternative to private car use.			It is expected the BRT will be built within the existing ROW, however at some BRT station locations roads will need to be widened. Close coordination with the existing operators needed to transition them into new business model and develop feeder route opportunities.	
<b>17) Project Area</b>		<b>18) Location Map/Site Photo</b>		
Two corridors for Phase 1A as shown with implementation of 3 BRT routes.		<div style="display: flex; justify-content: space-around;"> <div data-bbox="405 1630 895 1973"> <p>Phase 1A corridors</p> <p>Phase 1A Green Line Phase 1A Blue Line Circular rail</p> </div> <div data-bbox="922 1630 1449 1973"> <p>Phase 1A routes</p> <p>Existing BRT BRT 1 BRT 2 BRT 3 Circular rail</p> </div> </div> <p align="center">Source: YUTRA Project Team</p>		

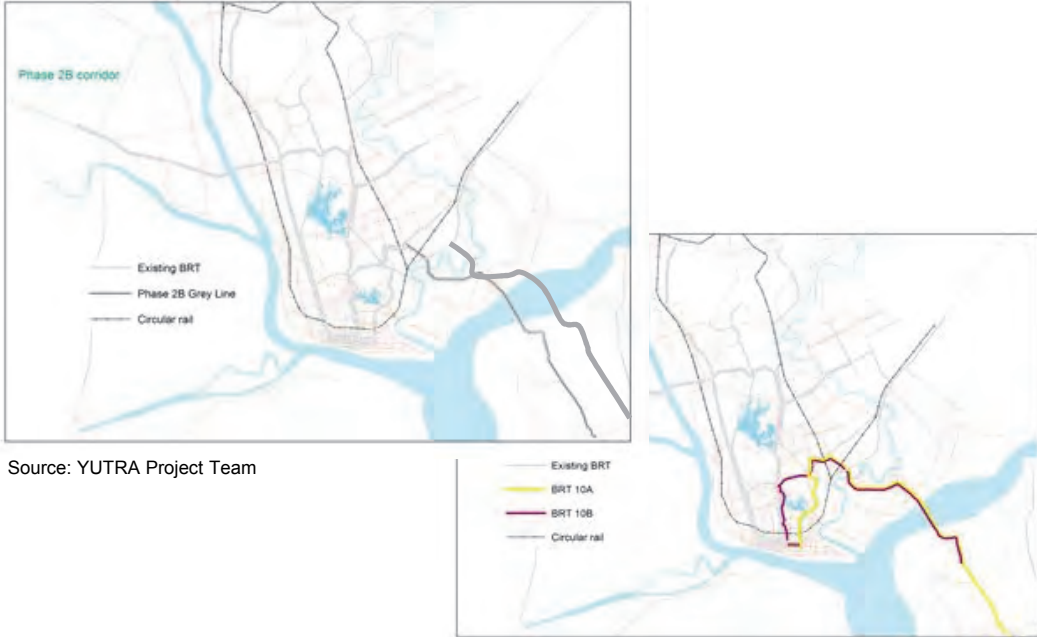
**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
BRT-1B	Bus Rapid Transit	<b>Phase 1B BRT Orange Line and Red Line Construction and Implementation</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Project Cost</b>	<b>7) Term</b>
YCDC		February 2015 to March 2017	Approximately US\$139.0 M	Short term
<b>8) Background/Current Issues</b>				
<ul style="list-style-type: none"> <li>- Developing an early BRT network is critical to retaining public transport market share</li> <li>- Developing a BRT system addresses many of the existing bus service problems and creates a more sustainable business model.</li> <li>- Close coordination and consultation with affected operators (those displaced by new routes) will require involvement of Matata.</li> </ul>				
<b>9) Project Outline</b>				
<ul style="list-style-type: none"> <li>- To construct <b>Phase 1B the Red Line and Orange Line</b> totalling <b>31.1 Km</b> of BRT busway and BRT stations and one bus depot</li> <li>- To implement a synchronised intersection control along the two busway corridors.</li> <li>- To rationalise bus routes and establish BRT operating companies to provide bus services to the system under performance-based contract.</li> <li>- Acquire bus fleet of <b>160 bi-articulated</b> buses.</li> <li>- <b>Implement BRT routes 4,5,6.</b></li> </ul>				
<b>10) Expected Project Effect</b>				
To add to the previous Phase 1A BRT project to expand the network, connecting the Airport and the Northern Intercity bus station to the CBD.				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
Establishment of the Project Management Unit to manage project and establish BRT Agency as network manager.				
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Project Cost</b>	
<p>a) Corridor Feasibility and Design Study : 3 months from February 2015 to April 2015</p> <p>b) Upon Approval: Detailed Design, Tender Document Preparation: 5 months from June 2015 to October 2015.</p> <p>c) Tendering: 3 months from November 2015 to January 2016</p> <p>d) Construction, Procurement, Installation 10 months from April 2016 to February 2017.</p> <p>e) PMU/ Bus agency will manage operator consultation and service development during detailed design and construction period.</p> <p><b>Commencement of Service: February 2017.</b></p>			<p>Infrastructure A15 US\$ 1.864 Mill. per km including busway, stations and ITS/ traffic systems. <b>Total US\$58.0M</b></p> <p>Bus Fleet Cost at US\$ 480,000 per bus <b>Total US\$76.8M</b></p> <p>Bus depot with CNG filling station <b>Total US\$ 4.0 M</b></p>	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
<p>The city benefits from an efficient mass transit network with the removal of old buses along these corridors. Passengers benefit from a high quality service and bus operators benefit from a more sustainable business model.</p> <p>The transport system in Yangon will be more energy and emissions efficient and provides a good alternative to private car use.</p>			<p>It is expected the BRT will be built within the existing ROW, however at some BRT station locations roads will need to be widened.</p> <p>Close coordination with the existing operators needed to transition them into new business model and develop feeder route opportunities.</p>	
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
Two corridors for Phase 1B as shown with implementation of 3 BRT routes.	<div style="display: flex; justify-content: space-around;"> <div data-bbox="368 1666 874 2027"> <p>Phase 1B Corridors</p> <ul style="list-style-type: none"> <li>Existing BRT</li> <li>Phase 1B Orange Line</li> <li>Phase 1B Red Line</li> <li>Circular rail</li> </ul> </div> <div data-bbox="890 1666 1453 2027"> <p>Phase 1B routes</p> <ul style="list-style-type: none"> <li>Existing BRT</li> <li>BRT 4</li> <li>BRT 5</li> <li>BRT 6</li> <li>Circular rail</li> </ul> </div> </div> <p align="center">Source: YUTRA Project Team</p>			

**PROJECT SUMMARY SHEET**




No.	1) Sector	2) Project Title		3) Project Type
BRT-2A	Bus Rapid Transit	<b>Phase 2A BRT Purple Line and Brown Line Construction and Implementation</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Project Cost</b>	<b>7) Term</b>
YCDC		November 2015 to February 2018	Approximately US\$111.25M	Short term
<b>8) Background/Current Issues</b>				
<ul style="list-style-type: none"> <li>- Developing an early BRT network is critical to retaining public transport market share</li> <li>- Developing a BRT system addresses many of the existing bus service problems and creates a more sustainable business model.</li> <li>- Close coordination and consultation with affected operators (those displaced by new routes) will require support and involvement of Matata.</li> </ul>				
<b>9) Project Outline</b>				
<ul style="list-style-type: none"> <li>- To construct <b>Phase 2A the Purple Line and Brown Line</b> totalling <b>30.0 Km</b> of BRT busway and BRT stations and one bus depot</li> <li>- To implement a synchronised intersection control along the two busway corridors.</li> <li>- To rationalise bus routes and establish BRT operating companies to provide bus services to the system under performance-based contract.</li> <li>- Acquire bus fleet of <b>96 CNG bi-articulated CNG buses (25m) and 21 CNG citybuses (12m)</b></li> <li>- <b>Implement BRT Routes 7,8,9.</b></li> </ul>				
<b>10) Expected Project Effect</b>				
To expand the BRT network of Phase 1 to the Eastern Arterial roads and provide an east west connection.				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Project Cost</b>	
a) Corridor Feasibility and Design Study : 3 months from Nov. 2015 to Jan. 2016 b) Upon Approval: Detailed Design, Tender Document Preparation: 5 months from March 2016 to July 2016. c) Tendering: 3 months from August 2016 to October 2016 d) Construction, Procurement, Installation 10 months from February 2017 to January 2018. e) PMU/ Bus agency will manage operator consultation and service development during detailed design and construction period. <b>Commencement of Service: February 2018.</b>			Infrastructure @ US\$ 1.864 Mill. per km including busway, stations and ITS/ traffic systems. Total US\$56.0M Bus Fleet Cost at US\$ 480,000 per bus (CNG bi-articulated) and US\$250,000 for CNG 12m citybus. Total US\$51.25 M One bus depot includes CNG fuelling station Total US\$4.0M .	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
The city benefits from an efficient mass transit network with the removal of old buses along these corridors. Passengers benefit from a high quality service and bus operators benefit from a more sustainable business model. The transport system in Yangon will be more energy and emissions efficient and provides a good alternative to private car use.			It is expected the BRT will be built within the existing ROW, however at some BRT station locations roads will need to be widened. Close coordination with the existing operators needed to transition them into new business model and develop feeder route opportunities.	
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
Two corridors for Phase 2A as shown with implementation of 3 BRT routes.	<div style="text-align: center;">Phase 1B maps</div>  <p style="text-align: center;">Source: YUTRA Project Team</p>			

**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
BRT-2B	Bus Rapid Transit	<b>Phase 2B BRT Grey Line Construction and Implementation</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Project Cost</b>	<b>7) Term</b>
YCDC		August 2016 to November 2018	Approximately US\$ 69.0M	Short term
<b>8) Background/Current Issues</b>				
-This final stage completes the integrated BRT network, to improve the quality, accessibility and connectivity of the public transport network .				
<b>9) Project Outline</b>				
<ul style="list-style-type: none"> <li>-To construct <b>Phase 2B Grey Line</b> totalling <b>16.9 Km</b> of BRT busway and BRTstations and one bus depot</li> <li>- To implement a synchronised intersection control along the two busway corridors.</li> <li>- To rationalise bus routes and establish BRT operating companies to provide bus services to the system under performance-based contract.</li> <li>- Acquire bus fleet of <b>56 CNG bi-articulated (25m) buses and 26 CNG Citybus(12m)</b></li> <li>- Implement BRT Routes 10A &amp; 10B</li> </ul>				
<b>10) Expected Project Effect</b>				
To expand the BRT network over the Bago Bridge to Thanlyin Township.				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Project Cost</b>	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
<b>17) Project Area</b>		<b>18) Location Map/Site Photo</b>		
One corridor (Grey Line) with implementation of 2 BRT routes.		 <p>Source: YUTRA Project Team</p>		



**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
BT-01	Bus Transport	Improvement of Existing Public Bus Transport Services in Yangon Region		
<b>3) Implementing Agency</b>		<b>4) Implementing Period</b>	<b>5) Preliminary Project Cost</b>	<b>6) Term</b>
Yangon Region Ministry of Transport, Transport Planning Department, Ma-htha-Central, YCDC		60 months	App. US\$ 108 mil.	Urgent
<b>8) Background/Current Issues</b>				
<ul style="list-style-type: none"> <li>- Even though the modal share of bus transport in Yangon Region accounts for more than 80%, the level of services provided by bus transport system is also widely considered to be deficient.</li> <li>- The level of bus services in terms of journey and waiting time, on-board crowding, reliability, etc. are not satisfactory.</li> <li>- Inadequate bus stop facilities such as sheltered waiting areas, seating, etc.</li> <li>- There is no traffic priority for any sort (lanes, signals, etc.) for buses, which get hopelessly stuck on congested roadways.</li> </ul>				
<b>9) Project Outline</b>				
<ul style="list-style-type: none"> <li>- Restructuring of bus network</li> <li>- Modernization of bus services</li> <li>- Development of bus terminals and interchanges</li> <li>- Prioritization of urban bus transport</li> </ul>				
<b>10) Expected Project Effect</b>				
<ul style="list-style-type: none"> <li>- To improve the efficiency of bus operation</li> <li>- To provide better level of public bus transport services</li> <li>- To reduce traffic congestion</li> </ul>				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
None			Development of BRT system in Yangon Region	
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Project Cost</b>	
Restructuring of bus network - Feasibility study: 6 Months - Detailed design, Tender Preparation, Tendering: 1.5 Years - Implementation: 1 Year - Commencement of operation: 2017 Modernization of bus services - Feasibility study: 6 Months - Detailed design, Tender Preparation, Tendering: 1.5 Years - Implementation: 1 Year - Commencement of service: 2017 Development of bus terminals and interchanges - Feasibility study: 6 Months - Detailed design, Tender Preparation, Tendering: 2.0 Years - Construction: 2.5 Years - Commencement of service: 2019 Prioritization of urban bus transport - Feasibility study: 6 Months - Detailed design, Tender Preparation, Tendering: 1.5 Years - Implementation: 1 Year - Commencement of operation: 2017			a) Introduction of functional network system including bus zone & reorganization of bus operators: US\$ 3 mil. (approximately) b) Bus fleets renewal, introduction of smart card, provision of passenger information, operation management by GPS: US\$ 50 mil. (approximately) c) Construction of bus terminals for each urban area: US\$ 20 mil. (approximately) d) Construction of facility for transfer passengers at connection point of major bus routes: US\$ 20 mil. (approximately) e) Introduction of bus lane and bus priority traffic light: US\$ 15 mil. (approximately) f) Total project cost: US\$ 108 mil.	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
All Yangon citizen (especially bus users)			No impact to both natural and social environment due to no land acquisition and civil works	
<b>17) Project Area</b>		<b>18) Location Map/Site Photo</b>		
a) Restructuring of bus network and modernization of bus services for whole Yangon Region b) Development of bus interchanges: 10 points (need further survey) c) Development of bus terminals: 4 points (need further survey) d) Prioritization of urban bus transport: 3 lanes (need further survey)		<p align="center">&lt;Current Condition&gt;</p> <div style="display: flex; justify-content: space-around;">    </div> <p>Source: YUTRA Project Team</p>		

**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
RL-01	Railway (TOD)	<b>TA for the Integration of Rail Transport Improvement and Station Area Urban Development in Yangon (Enhancing Transit Oriented Development)</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		15 months	App. USD 1 mil.	Urgent
<b>8) Background/Current Issues</b> MR has some lands which has high property value such as Yangon Central Station area, Malwagone Depot/Workshop Area, etc. Many foreign developers are interested in redeveloping the areas and submitted their proposals. It is the good tendency, but MR has to handle and control the development plan in order to maximize the public development benefit and divert the benefit to the transport projects such as modernization of the existing railway infrastructure and/or new urban transport system development.				
<b>9) Project Outline</b> • To prepare conceptual station area urban development plan in the available MR. railway land. • To prepare standard RfP and contract document for biddings for Replace/Redevelopment of railway land which will be developed by any private firms. The RfP may require developer to relocate the existing function in current yards to be developed such as stabling yard, depot, workshop, etc. and to modernize the existing railway and/or install new transit system by using their benefit obtained from the land development.				
<b>10) Expected Project Effect</b> • To establish a coordination mechanism between MR. and organizations responsible for urban development along railway lines particularly in station areas • To prepare a conceptual station area development plan including inter-modal transfer facilities and urban development which will be able to enhance usages of railway system, • To estimate development benefit from the urban development and to prepare PPP (Public Private Partnership) guide lines for the station area development.				
<b>11) Needs/Request from Myanmar side</b> MORT/MR requested to assist tender preparation mainly for Yangon central station.			<b>12) Relation with Other Projects</b> [RL-07], [RL-09], [RL-10], [RL-14], [RL-16], [RL-19], [RL-22]	
<b>13) Implementing Schedule</b> General procedure: 4months Consultant employment: 3minths Technical Assistance: 8months			<b>14) Rough Breakdown of Preliminary Construction Cost</b> USD 1mil. For TA	
<b>15) Beneficiaries</b> MORT/MR, potential developers.			<b>16) Impact to Environment (Natural/Social)</b> No impact due to TA.	
<b>17) Project Area</b> All Urban Section of Myanmar Railway in Greater Yangon		<b>18) Location Map/Site Photo</b>  <div style="display: flex; justify-content: space-around;"> <div data-bbox="399 1344 1005 1680"> <p>&lt; Image &gt;</p> <p>Source: YUTRA Project Team</p> </div> <div data-bbox="1005 1344 1452 1881"> <p>&lt; Main MR Yards &gt;</p> <p><small>Note: Not to scale. Yellow shaded areas are just surrounded area by MR and does not mean the land holder owned by MR.</small></p> </div> </div>		



**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
RL-02	Railway	<b>TA for Commuter Service Level Enhancement in Greater Yangon</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		36 months	App. USD 2 mil.	Urgent
<b>8) Background/Current Issues</b> Almost current issues/problems regarding Yangon Circular Railway (western half) will be solved by "[RL-5] Yangon Circular Railway Improvement Phase1: Western Half Loop" hence the Yen Loan amount is huge. After the completion of the improvement project, Yangon Circular Railway can play a role as main axle of commuter. However, we should wait for the commencement of the operation until short-term target year at the soonest. Until then, it is necessary to conduct any temporary countermeasures in order to enhance modal shift from road to railway, contribute traffic jam reduction, and provide better commuting service to Yangon citizens.				
<b>9) Project Outline</b> <ul style="list-style-type: none"> <li>• Support to establish an effective train operation plan and diagram for commuter,</li> <li>• Establishing "Commuter Service Improvement Dept." and the capacity building, and</li> <li>• Technical Assistance for the existing passenger wagon interior upgrade work for commuter.</li> </ul>				
<b>10) Expected Project Effect</b> <ul style="list-style-type: none"> <li>• At present, punctuality of trains on Yangon Circular Railway is low due to influence from delay of high-class trains on Yangon-Mandalay Main Line/Pyay Line, and it causes the tendency that commuter does not use railroad. After the TA, to establish an effective train operation plan and diagram for commuter.</li> <li>• To make MR staffs recognizing the importance of the commuter service and train them.</li> <li>• To enhance modal shift from road to railway by providing better passenger wagon for commuter.</li> </ul>				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
GM of MR express his interest.			It contribute to all railway projects.	
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Construction Cost</b>	
General procedure: 12 months Consultant employment: 6 months TA: 18months			USD 2mil. For TA	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
MR staffs, all MR users.			No impact due toTA.	
<b>17) Project Area</b>		<b>18) Location Map/Site Photo</b>		
All Urban Section of Myanmar Railway in Greater Yangon		< Image > 		

Source: YUTRA Project Team







**PROJECT SUMMARY SHEET**


No.	1) Sector	2) Project Title		3) Project Type
RL-03	Railway	<b>Railway Central Control Center System Installation (The study is ongoing by JICA)</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		decided in the study.	decided in the ongoing study.	Urgent
<b>8) Background/Current Issues</b>				
<p>The study is ongoing by JICA. The purpose of the study is to decide the scope of grant aid for railway safety facilities. The current railway has some problems/issues. For example, Yangon Circular Railway has installed automatic color light signal, however, the system is quite old and has many problems such as frequent malfunction with no changing signal color due to fail-safe system worked by short-circuited track circuit by water-soaked track in every rainy season. Therefore, all trains are in dangerous train operation depending driver's eye-checking without reliable signal and train detection system during signal malfunction. In addition, the current railway has many level crossings which are manually operated (opened and closed) by railway staff, and it brings chronic traffic congestions at all level crossing points.</p>				
<b>9) Project Outline</b>				
<p>In order to eliminate the problems, appropriate safety facilities such as OCC, electronic interlocking device, etc., will be installed as urgent countermeasure by JICA grant aid.</p>				
<b>10) Expected Project Effect</b>				
<p>To improve reliability of train operation and safety condition in Yangon Central station and suburban section of Yangon-Mandalay line.</p>				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
Requested to Japanese side, and now ongoing project.			[RL-05], [RL-07], [RL-13], [RL-14]	
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Construction Cost</b>	
<p>The period is planned in the ongoing study. The below is reference estimation.                      Study: 6months                      General procedure: 3months                      Consultant employment: 3months                      Design &amp; Tender Preparation: 6months                      Tender Procedure: 6months                      Construction &amp; Procurement: 12months</p>			<p>Procurement and installation of safety devices and facilities: the cost will be decided in the ongoing study.</p>	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
MORT/MR, all Yangon-Mandalay suburban line users			No impact due to only equipment installation inside MIR yard and building.	
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
<p>Yangon central station, Yangon-Mandalay line suburban section.</p>	<p align="center">&lt; Current Condition &gt;</p> <div style="display: flex; justify-content: space-around;">   </div> <p>Source: YUTRA Project Team</p>			



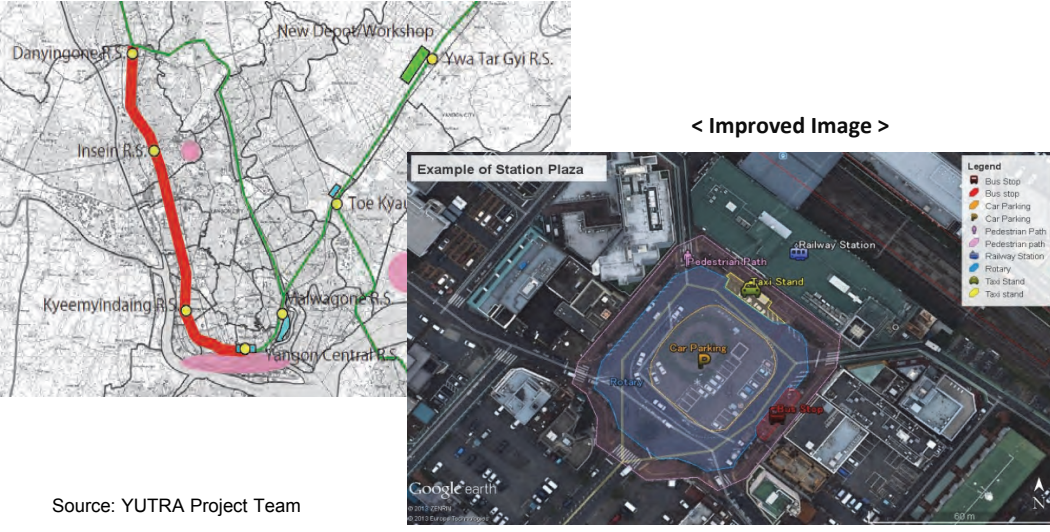
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No.	1) Sector	2) Project Title		3) Project Type
RL-04	Railway	<b>TA for Railway Safety and Service Improvement (Ongoing by JICA)</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		24 months	-	Urgent
<b>8) Background/Current Issues</b>				
<p>The TA is ongoing by JICA. At present, daily MR passenger is reached to approximately 200,000 and about half of them are for Yangon Circular Railway and the suburban lines. On the other hand, the current condition is quite poor and accident and delay become constantly.</p>				
<b>9) Project Outline</b>				
<p>i) to establish plan for improvement of operation for enhancement of safety and service, and                      ii) technical capacity building/technical transfer for track maintenance skill by using Yangon-Mandalay suburban line.</p>				
<b>10) Expected Project Effect</b>				
To reduce railway accident.				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
Ongoing project.			[RL-13], and all the other railway improvement projects.	
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Construction Cost</b>	
Technical Assitance: 24months			-	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
MR staffs, all MR users.			No impact due to equipment procurement and technical transfer training inside MR yard.	
<b>17) Project Area</b>		<b>18) Location Map/Site Photo</b>		
Suburban section of Yangon-Mandalay Line		< Current Condition (between Yangon and Bago) >		
		<div style="display: flex; flex-wrap: wrap; justify-content: space-around;">     </div> <p style="text-align: right; font-size: small;">Source: YUTRA Project Team</p>		

**PROJECT SUMMARY SHEET**


No.	1) Sector	2) Project Title		3) Project Type
RL-05	Railway	<b>Yangon Circular Railway Improvement (Non-electrified) Phase1: Western Half Loop</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		84 months	App. USD 485 mil.	Short
<b>8) Background/Current Issues</b> Yangon Circular Railway surrounds the city center by 47km length line. The line, especially the western half, has high potentiality as urban railway line due to passing high value areas such as business district, high density residential area, etc. However, the railway is inferior to the other public transport mode such as bus in terms of all aspects such as punctuality, quick-deliverability, safety, comfortability and accessibility at present due to the deteriorated infrastructures, the lack of feeder connection, etc. It causes the tendency that Yangon citizens, especially high and middle class people, do not use railway service so much. The western half of Yangon Circular Railway (Yangon Central Station – Insein Station – Danyingone Station with 21km length) which passes high population density areas is categorized as future main transport axis linking the north with the south in the city center.				
<b>9) Project Outline</b> <ul style="list-style-type: none"> <li>• Civil Structure Improvement (Drainage Improvement, Embankment/Cut Improvement, Bridge Improvement, Culvert Improvement)</li> <li>• Track Improvement (Replace Rail from existing 37kg/m rail to 50kg/m rail, Install New PC sleeper for 50kg/m rail, Spread new ballast)</li> <li>• Signaling &amp; Telecom System Modernization</li> <li>• Station and Station Facility Improvement (High height platform, ticket selling system improvement, introduction of AFC system with IC card)</li> <li>• DEMU Procurement</li> <li>• Improve existing Kyeemyindaing depot and Insein workshop for new DEMU</li> <li>• Installation of automatic level crossing</li> </ul> Note that no elevated and no electrified are applied.				
<b>10) Expected Project Effect</b> <ul style="list-style-type: none"> <li>• To facilitate the modal shift from road to railway transport, especially the north - south direction transport.</li> <li>• To reduce road traffic volume and traffic congestions.</li> <li>• To improve the transport condition between the north Yangon and CBD area drastically, especially commuting condition.</li> </ul>				
<b>11) Needs/Request from Myanmar side</b> Myanmar minister express their request to Japanese minister.		<b>12) Relation with Other Projects</b> [RL-06], [RL-07], [RL-08], [RL-09], [RL-10], [RL-11], [RL-12]		
<b>13) Implementing Schedule</b> F/S: 10months General procedure: 6months Consultant employment: 8months Design & Tender Preparation: 18months Tender Procedure: 12months Construction & Procurement: 30months		<b>14) Rough Breakdown of Preliminary Construction Cost</b> - Track, Civil, Signal&Telecom, Station Improvement: USD15mil. x 21km=USD315mil. -DEMU procurement: USD120mil. (=USD2mil./car x 6cars x 10trains) -Upgrading depot/workshop: USD50mil.		
<b>15) Beneficiaries</b> All Yangon citizens, especially citizens living along the line.		<b>16) Impact to Environment (Natural/Social)</b> No land acquisition and resettlement due to all work inside MR yard. Some noise and vibration during construction.		
<b>17) Project Area</b> Yangon Central Station - Kyeemyindaing Station - Insein Station - Danyingone Station	<b>18) Location Map/Site Photo</b>  <p>Source: YUTRA Project Team</p>			

**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
RL-06	Railway	<b>TOD Enhancement Project along Yangon Circular Railway Western Half</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		48 months	App. USD 6 mil.	Short
<b>8) Background/Current Issues</b>				
The project is conducted as supplemental project of Yangon Circular Railway Improvement Phase1: Western Half Loop, in order to enhance the improvement effect of the railway and increase the number of passengers				
<b>9) Project Outline</b>				
The project scope is to provide station plaza with bus stop at main stations along the line such as Kyeemyindaing R.S., Insein R.S., and Danyingone R.S. Yangon Central station is excluded from the target station because there is an another project named as "[RL-7] Yangon Central Station Redevelopment Project". Kyeemyindaing station and Insein station will be included in the project scope, although there are an another projects named as "[RL-9] Kyeemyindaing Station Yard Redevelopment Project" and "[RL-10] Insein Workshop Area Redevelopment Project" respectively, because the projects are conducted as middle-term project and minimum function should be installed as short-term countermeasure.				
<b>10) Expected Project Effect</b>				
To improve transport hub function of each stations. To improve feeder access condition from/to station. To increase the passenger number and enhance convenience of Yangon Circular Railway.				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
It is proposed from study team. MR's GM understand the importance.			Close relation with [RL-05], [RL-09], [RL-10].	
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Construction Cost</b>	
Study: 6months General procedure: 6months Consultant employment: 6months Design & Tender Preparation: 8months Tender Procedure: 10months Construction & Procurement: 12months			USD6mil.=1ha x USD2mil. x 3stations	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
Yangon Circular Railway western half users			Little land acquisition and resettlement due to work inside road and MR yard. Some traffic restriction to be required during construction.	
<b>17) Project Area</b>		<b>18) Location Map/Site Photo</b>		
Main stations along Yangon Circular Railway western half (Insein, Kyeemyindaing, Danyingone)		 <p>The figure consists of two main parts. On the left is a location map of the Yangon Circular Railway western half, showing a red line connecting several stations: Danyingone R.S., Insein R.S., Kyeemyindaing R.S., and Yangon Central R.S. Other nearby stations like New Depot/Workshop, Ywa Tar Gyi R.S., Toe Kyat, and Malwagone R.S. are also marked. On the right is an aerial site photo of a station plaza, labeled 'Example of Station Plaza'. This photo shows a detailed layout with a central 'Railway Station' building, a large 'Car Parking' area, a 'Pedestrian Path', a 'Taxi Stand', and a 'Bus Stop'. A legend on the right side of the photo identifies these features with colored symbols: Bus Stop (red circle), Car Parking (yellow circle), Pedestrian Path (blue line), Railway Station (blue square), Taxi Stand (green circle), and Bus Stop (yellow circle).</p> <p>Source: YUTRA Project Team</p>		

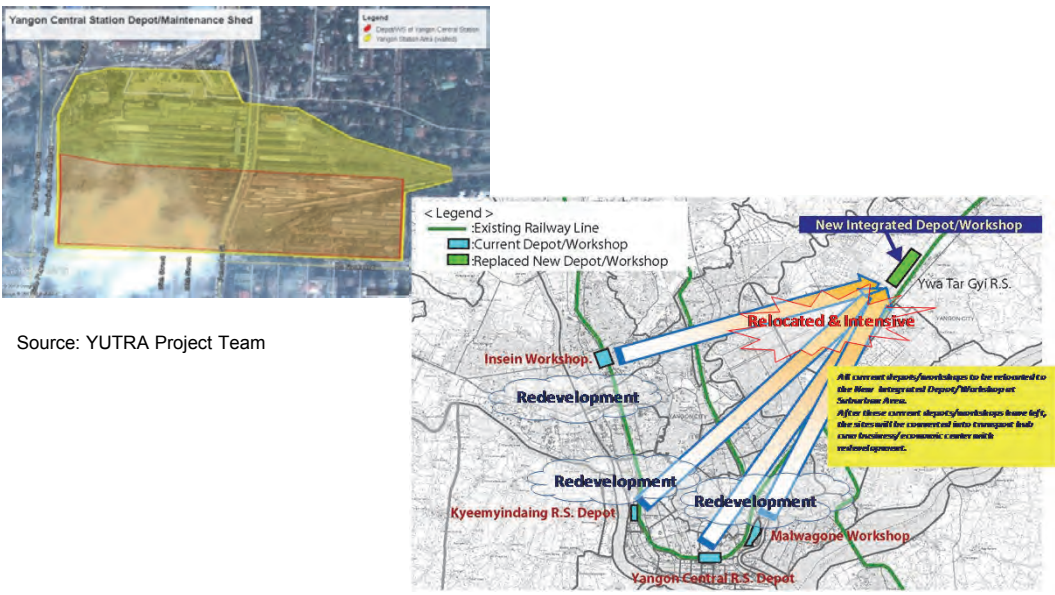


**PROJECT SUMMARY SHEET**


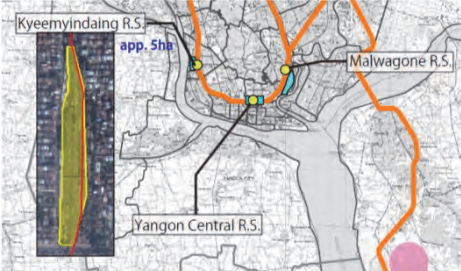
No.	1) Sector	2) Project Title		3) Project Type
RL-07	Railway	Yangon Central Station Redevelopment Project		
4) Implementing Agency		5) Implementing Period	6) Preliminary Construction Cost	7) Term
MORT/MR		66 months	App. USD 704 mil.	Short
<b>8) Background/Current Issues</b>				
<p>Yangon Central station yard is the most attractive land for commercial and business use among MR's lands, because the yard has large area and is situated at the heart of Yangon city and commercially strategic location, although MR has some lands along the railway line in the Study area. Therefore, several private developers already expressed their interests in redevelopment and the other potential developers may express their interests near future.</p> <p>Yangon Central station yard surrounded by wall is approximately 16ha. (note: although actual Yangon Central station area owned by MR is 29ha, remaining 13ha is fully used by many apartments/housings for MR staffs, stops, etc.)</p>				
<b>9) Project Outline</b>				
<p>The redevelopment plan should be prepared by selected developer from the commercial viewpoint, although layout of business offices, commercial facilities, residential apartments, etc. are expected. However, the redevelopment area will play roles as not only commercial and business center but also transit hub because the station accept entering many transit mode and pedestrians. In order to fulfill the function as transport hub, the following public functions and the integration should be considered.</p> <p>&lt; Public Transport Transfer &gt;: MR lines (Yangon Circular Railway, Yangon Suburban Lines, Middle and Long Distance Trains), UMRT Line1, BRT stations (2 routes are planned), Feeder bus terminal, Taxi stand</p> <p>&lt; Private Vehicle Connection &gt;: Road connection including access rotary road to station entrance, bus terminal, and taxi stand, etc., Car parking for Park &amp; Ride or commercial / business building users</p> <p>&lt; Others &gt;: Pedestrian path, Green space</p> <p>It is recommended to conduct the project by PPP scheme in order to maximize use of private investor's fund. It is a one of options that public side (MR) provides their land and private side (developer) develop the area including public facilities by their own fund, and developer pay decided royalty to MR</p>				
<b>10) Expected Project Effect</b>				
<p>The number of railway users including business/commercial area will be increased due to high ability to attract users and having high transport hub function.</p>				
<b>11) Needs/Request from Myanmar side</b>		<b>12) Relation with Other Projects</b>		
<p>MORT/MR requested to Japanese side to support the project.</p>		<p>The redevelopment area currently has depot and maintenance shed, etc. Necessary to relocate the functions to any substituted yard by [RL-08]. The relocation to be conducted by the development benefit.</p> <p>In addition, Result of SUDP, [RL-01], [RL-03], [RL-05], [RL-13].</p>		
<b>13) Implementing Schedule</b>		<b>14) Rough Breakdown of Preliminary Construction Cost</b>		
<p>F/S and Tender Preparation: 5months  Tender Procedure: 4months  Design: 15months  Construction &amp; Procurement: 42months</p>		<p>a) Developed area: 16ha  b) Unit cost for public infrastructure development: USD2mil./ha  c) Unit building cost =10,000m<sup>2</sup> x 70% x building coverage ratio (50%) x floor area ratio (800%) x floor construction unit cost (US\$1500/m<sup>2</sup>)=USD42mil./ha  d) Construction cost: 16ha x (USD2mil./ha + USD42mil./ha)=USD704mil.</p>		
<b>15) Beneficiaries</b>		<b>16) Impact to Environment (Natural/Social)</b>		
<p>MORT/MR, and Yangon Central station users.</p>		<p>In case of the redevelopment inside walled area, no land acquisition and resettlement is required.</p> <p>Some traffic jam, noise and vibration during construction.</p>		
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
<p>inside Yangon Central Station yard</p>	<p align="center"><b>Draft conceptual image</b></p>  <p align="right">Source: YUTRA Project Team</p>			






**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
RL-08	Railway	<b>New Integrated Depot and Workshop Construction Project (Integration and Relocation of Current Depots and Workshops to Yangon Suburban Area) :Phase1</b>		
4) Implementing Agency		5) Implementing Period	6) Preliminary Construction Cost	7) Term
MORT/MR		42 months	App. USD 64 mil.	Short
<b>8) Background/Current Issues</b> According to a series of the railway yard redevelopments projects, these existing functions as depot and/or workshop should be relocated to any substituted yard. because these depot/workshop areas are also redeveloped to commercial and business area. From the above reasons, it is planned to establish a new integrated depot and workshop at the ourshirt of Yangon city. [RL-07] Yangon central station yard redevelopment project is a one of them and is expected as the first redevelopment project.				
<b>9) Project Outline</b> There is a huge land which is owned by MR at the northern side of Ywa Tar Gyi station along Yangon-Mandalay line. Therefore, it is proposed to use the yard for the project. The whole integrated new depot and workshop will be established by phasing development due to the difference of timing to redevelop each yards, and this project will be the first phase for relocation of the existing function (depot and maintenance shed) in Yangon Central station yard. 16ha of Yangon Central station yard to be redeveloped, the required substitute land area is assumed as 16ha. The relocation cost to be born from the development benefit of Yangon central staiton yards.				
<b>10) Expected Project Effect</b> Yard redevelopment projects can be implemented. Depot and workshop equipments and buildings are renewed.				
<b>11) Needs/Request from Myanmar side</b> MR has their plan to move the function of Yangon central station to Ywa Tar Gyi yard.			<b>12) Relation with Other Projects</b> [RL-07]	
<b>13) Implementing Schedule</b> F/S and Tender Preparation: 6months Tender Procedure: 6months Design: 12months Construction & Procurement: 18months			<b>14) Rough Breakdown of Preliminary Construction Cost</b> a) Relocation area: 16ha b) Unit cost for depot/workshop development:USD4mil./ha c) Total=16ha x USD4mil./ha=USD64mil.	
<b>15) Beneficiaries</b> MORT/MR			<b>16) Impact to Environment (Natural/Social)</b> Some resettlement to be required although the land is owned by MR. Some traffic jam, noise and vibration during construcion. Working place of labour is moved.	
<b>17) Project Area</b> Yangon central station and Ywa Tar Gyi station yard	<b>18) Location Map/Site Photo</b>  <p>Source: YUTRA Project Team</p>			

**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
RL-09	Railway	<b>Kyee Myin Daing Station Yard Redevelopment Project</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		66 months	App. USD 220 mil.	Middle
<b>8) Background/Current Issues</b> Kyee Myin Daing station, which is the one of major stations along the western half of Yangon Circular Railway, is located at the western edge of CBD and has small depot with approximately 5ha surrounded by wall. This area has potential to be the middle-scale transit hub with commercial and business functions, therefore there is a possibility any private investors express their interest to redevelop the yard.				
<b>9) Project Outline</b> The redevelopment plan should be prepared by selected developer from the commercial viewpoint, although layout of business offices, commercial facilities, residential apartments, etc. are expected. However, the redevelopment area will play roles as not only commercial and business center but also transit hub because the station accept entering many transit mode and pedestrians. In order to fulfill the function as transport hub, the following public functions and the integration should be considered. < Public Transport Transfer > MR lines (Yangon Circular Railway), Feeder bus terminal, Taxi stand < Private Vehicle Connection > Road connection including access rotary road to station entrance, bus terminal, and taxi stand, etc., Small car parking < Others > Pedestrian path It is recommended to conduct the project by PPP scheme in order to maximize use of private investor's fund. It is a one of options that public side (MR) provides their land and private side (developer) develop the area including public facilities by their own fund, and developer pay decided royalty to MR.				
<b>10) Expected Project Effect</b> The number of railway users including business/commercial area will be increased due to high ability to attract users and having high transport hub function.				
<b>11) Needs/Request from Myanmar side</b> No request from Myanmar side yet, but there are high possibility to express their interest due to obtaining development benefit.		<b>12) Relation with Other Projects</b> The redevelopment area currently has depot and maintenance shed, etc. Necessary to relocate the functions to any substituted yard by [RL-11]. The relocation to be conducted by using the development benefit. In addition, Result of SUDP, [RL-01], [RL-05], [RL-06], [RL-12].		
<b>13) Implementing Schedule</b> F/S and Tender Preparation: 5months Tender Procedure: 4months Design: 15months Construction & Procurement: 42months		<b>14) Rough Breakdown of Preliminary Construction Cost</b> a) Developed area: 5ha b) Unit cost for public infrastructure development: USD2mil./ha c) Unit building cost =10,000m <sup>2</sup> x 70% x building coverage ratio (50%) x floor area ratio (800%) x floor construction unit cost (US\$1500/m <sup>2</sup> )=USD42mil./ha d) Construction cost: 5ha x (USD2mil./ha + USD42mil./ha)=USD220mil.		
<b>15) Beneficiaries</b> MORT/MR, and Yangon Circular Railway users, especially Kyee Myin Daing Station users.		<b>16) Impact to Environment (Natural/Social)</b> In case of the redevelopment inside walled area, no land acquisition and resettlement is required. Some traffic jam, noise and vibration during construction.		
<b>17) Project Area</b> Kyee Myin Daing station yard	<b>18) Location Map/Site Photo</b> <div style="display: flex; justify-content: space-around;"> <div data-bbox="427 1749 823 2018"> <p>Current Kyee Myin Daing Station Yard</p>  <p>Source: YUTRA Project Team</p> </div> <div data-bbox="874 1749 1337 2018">  </div> </div>			

**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
RL-10	Railway	<b>Insein Workshop Area Redevelopment Project</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		66 months	App. USD 1,144 mil.	Middle
<b>8) Background/Current Issues</b>				
<p>Insein station, which is the one of major stations along the western half of Yangon Circular Railway, is located near Mindama area which is appointed as the sub-center in SUDP. Therefore, there is a possibility that this station will be transfer station from Yangon Circular Railway to feeder transits to Mindama sub-center, etc. In addition, the one of the main workshops in MR, named as Insein Workshop, is located beside the station. The development potential of Insein workshop is quite high due to the abovementioned location and the huge yard with approximately 26ha. Therefore, there is a possibility any private investors express their interest to redevelop the yard.</p>				
<b>9) Project Outline</b>				
<p>The redevelopment plan should be prepared by selected developer from the commercial viewpoint, although layout of business offices, commercial facilities, residential apartments, etc. are expected. However, the redevelopment area will play roles as not only commercial and business center but also transit hub because the station accept entering many transit mode including Yangon Circular Railway, UMRT Line2, BRT, feeder buses, taxis, private vehicles, and pedestrians. In SUDP, Insein workshop is selected as the target for TOD case study. In the study, it is proposed to apply phasing development for the area.</p>				
<b>10) Expected Project Effect</b>				
<p>The number of railway users including business/commercial area will be increased due to high ability to attract users and having high transport hub function.</p>				
<b>11) Needs/Request from Myanmar side</b>		<b>12) Relation with Other Projects</b>		
<p>No request from Myanmar side yet, but there are high possibility to express their interest due to obtaining development benefit.</p>		<p>The redevelopment area currently has depot and maintenance shed, etc. Necessary to relocate the functions to any substituted yard by [RL-11]. The relocation to be conducted by using the development benefit. In addition, Result of SUDP, [RL-01], [RL-05], [RL-06], [RL-12].</p>		
<b>13) Implementing Schedule</b>		<b>14) Rough Breakdown of Preliminary Construction Cost</b>		
<p>F/S and Tender Preparation: 5months Tender Procedure: 4months Design: 15months Construction &amp; Procurement: 42months</p>		<p>a) Developed area: 26ha b) Unit cost for public infrastructure development: USD2mil./ha c) Unit building cost =10,000m<sup>2</sup> x 70% x building coverage ratio (50%) x floor area ratio (800%) x floor construction unit cost (US\$1500/m<sup>2</sup>)=USD42mil./ha d) Construction cost: 26ha x (USD2mil./ha + USD42mil./ha)=USD1,144mil.</p>		
<b>15) Beneficiaries</b>		<b>16) Impact to Environment (Natural/Social)</b>		
<p>MORT/MR, and Yangon Circular Railway users, especially Insein Station users.</p>		<p>In case of the redevelopment inside walled area, no land acquisition and resettlement is required. Some traffic jam, noise and vibration during construction.</p>		
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
<p>Insein station yard</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p style="color: red; font-weight: bold;">The conceptual image drafted in SUDP</p>  <p><b>Development Policy</b></p> <ul style="list-style-type: none"> <li>◆ Utilize workshop area for development</li> <li>◆ Introduce following facilities:                             <ul style="list-style-type: none"> <li>▶ business offices,</li> <li>▶ commercial facilities,</li> <li>▶ residential apartments</li> </ul> </li> <li>◆ park &amp; ride facility</li> <li>◆ Integrate Inter-modal facilities (Railway, BRT, Feeder Bus, Taxi, Car)</li> <li>◆ Connect buildings by pedestrian deck</li> <li>◆ Separate pedestrians and vehicles</li> <li>◆ Introduce enough green space inside development area</li> <li>◆ Connect transportation near station with north highway</li> </ul> </div> <div style="width: 50%;">   </div> </div>			

Source: YUTRA Project Team



**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title	3) Project Type
RL-11	Railway	<b>New Integrated Depot and Workshop Construction Project (Integration and Relocation of Current Depots and Workshops to Yangon Suburban Area) :Phase3</b>	
4) Implementing Agency	5) Implementing Period	6) Preliminary Construction Cost	7) Term
MORT/MR	42 months	App. USD 104 mil.	Middle

**8) Background/Current Issues**

According to a series of the railway yard redevelopments projects, these existing functions as depot and/or workshop should be relocated to any substituted yard. because these depot/workshop areas are also redeveloped to commercial and business area. From the above reasons, it is planned to establish a new integrated depot and workshop at the ourshirt of Yangon city.  
[RL-09] Kyeemyindaing yard redevelopment and [RL-10] Insein Workshop yard redevelopment are some of them.

**9) Project Outline**

There is a huge land which is owned by MR at the northern side of Ywa Tar Gyi station along Yangon-Mandalay line. Therefore, it is proposed to use the yard for the project.  
The whole integrated new depot and workshop will be established by phasing development due to the difference of timing to redevelop each yards, and this project will be the third phase for relocation of the existing function (depot and workshop) in Kyeemyindaing yard and Insein yard. 26ha of Kyeemyindaing yard and Insein workshop yard to be redeveloped, the required substitute land area is assumed as 26ha.  
The relocation cost to be born from the development benefit of each yards.

**10) Expected Project Effect**

Yard redevelopment projects can be implemented.  
Depot and workshop equipments and buildings are renewed.

**11) Needs/Request from Myanmar side**

No information about their interest to Japanese side yet.

**12) Relation with Other Projects**

[RL-09], [RL-10]

**13) Implementing Schedule**

F/S and Tender Preparation: 6months  
Tender Procedure: 6months  
Design: 12months  
Construction & Procurement: 18months

**14) Rough Breakdown of Preliminary Construction Cost**

a) Relocation area: 26ha  
b) Unit cost for depot/workshop development:USD4mil./ha  
c) Total=26ha x USD4mil./ha=USD104mil.

**15) Beneficiaries**

MORT/MR

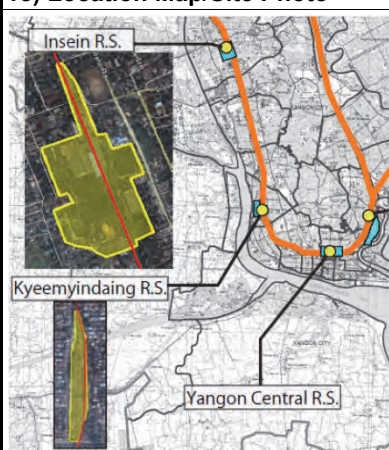
**16) Impact to Environment (Natural/Social)**

Some resettlement to be required although the land is owned by MR.  
Some traffic jam, noise and vibration during construction.  
Working place of labour is moved.

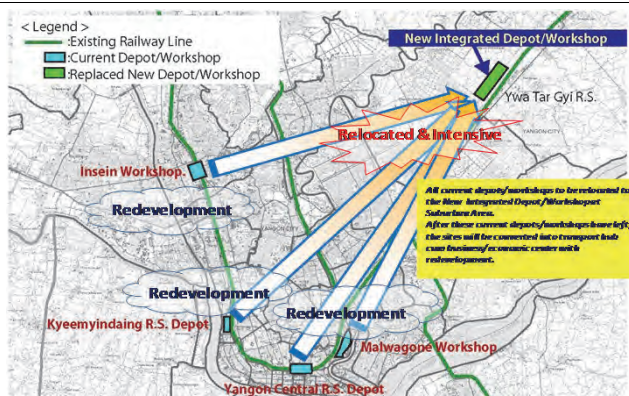
**17) Project Area**

Kyeemyindaing station yard, Insein workshop and Ywa Tar Gyi station yard

**18) Location Map/Site Photo**

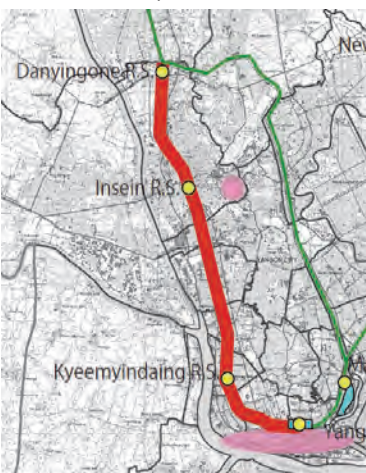



Source: YUTRA Project Team

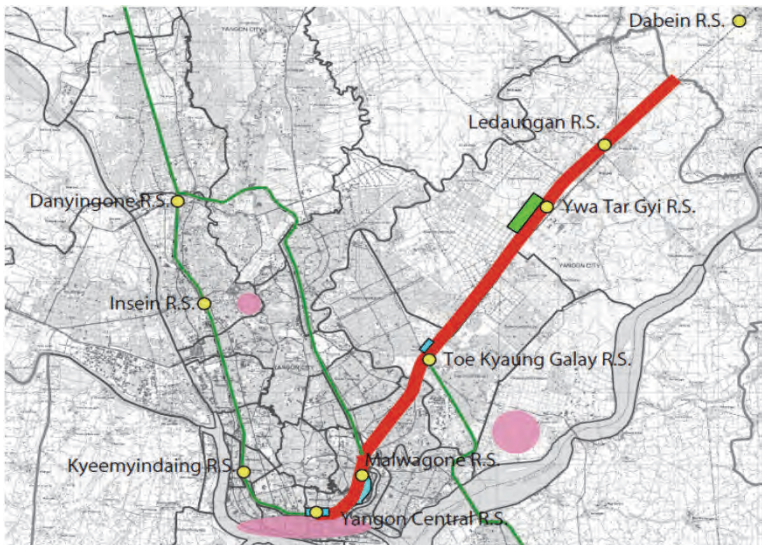




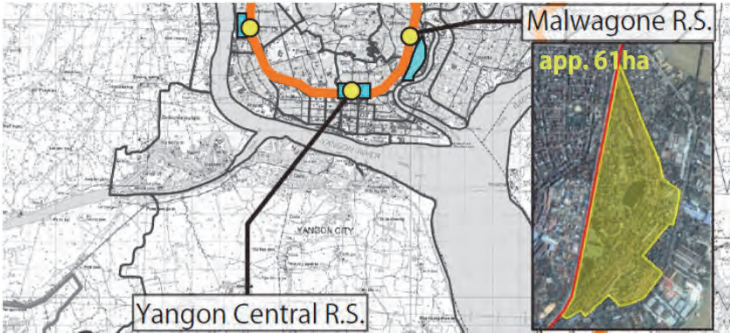
**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
RL-12	Railway	<b>Electrified and Elevated Project for Yangon Circular Railway Western Half</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		126 months	App. USD 1,260 mil.	Long
<b>8) Background/Current Issues</b> Enough effect will be obtained from “[RL-5] Yangon Circular Railway Improvement (Non-electrified) Phase1: Western Half Loop” as short-term project hence the speed, frequency, comfortability and safety are improved drastically. However, from the middle and long term view point, electrification and grade separation will be essential because i) high frequent operation will not be allowed due to the limitation of level crossing closing time in case of at-grade, ii) electrified railway can save the operation cost in case of high frequent operation, iii) elevated railway ensure safety from traffic accident at level crossing, etc. Especially, along the western half of Yangon Circular Railway is high population density area and many road vehicles cross the line. Hence, the line should be elevated.				
<b>9) Project Outline</b> The western half of Yangon Circular Railway, which runs Yangon Central Station – Insein Station – Danyingone Station with 21km length, is to be electrified and elevated as long-term project. Actual project implementation schedule should be reviewed by the possibility of stable power supply, budget allocation, etc.				
<b>10) Expected Project Effect</b> <ul style="list-style-type: none"> <li>• To assure the modal shift from road to railway transport, especially the north - south direction transport.</li> <li>• To reduce traffic congestions due to grade separation.</li> <li>• To improve the transport capacity and travel speed of the line.</li> </ul>				
<b>11) Needs/Request from Myanmar side</b> MR intend to improve the line although no memtion about electrification.			<b>12) Relation with Other Projects</b> [RL-05], [RL-09], [RL-10]	
<b>13) Implementing Schedule</b> F/S: 12months General procedure: 6months Consultant employment: 6months Design & Tender Preparation: 18months Tender Procedure: 12months Construction & Procurement: 72months			<b>14) Rough Breakdown of Preliminary Construction Cost</b> - Unit cost to be electrified and elevated including all construction and procurement per km: USD60mil -USD60mil. X 21km = USD1,260mil.	
<b>15) Beneficiaries</b> All Yangon citizens, especially citizens living along the line.			<b>16) Impact to Environment (Natural/Social)</b> Some land acquisition and resettlement due to new depot/workshop construction and elevated construction although almost work inside MR yard. Some noise and vibration during construction.	
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>&lt; Location Map &gt;</p>  <p>Source: YUTRA Project Team</p> </div> <div style="text-align: center;"> <p>&lt; Improved image &gt;</p>  </div> </div>			

**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
RL-13	Railway	<b>Yangon-Mandalay Line Improvement: Phase1 (Partial operation)</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		66 months	App. USD 144 mil.*	Short
<b>8) Background/Current Issues</b>				
<p>The project will be conducted as a part of Yangon-Mandalay Line Improvement Project funded by JICA (Yen Loan). The project section will be 267.2km between Yangon Central Station and Toungoo Station. Although the project is for intercity railway improvement, the project section is including Yangon suburban line in Yangon-Mandalay Line, and the section will be used for commuter railway.</p>				
<b>9) Project Outline</b>				
<p>The project scope is composed of earthwork improvement, bridge improvement, track Improvement, other civil works, signaling &amp; telecom system modernization including automatic level crossing installation, procurement of rolling stocks (DMU and DEMU) with maintenance facilities, and rehabilitation of two freight terminals (Satsan and Botataung). The project is conducted as a national transport condition improvement project.</p> <p>On the other hand, it is not clear whether the number of DEMU procured by the national transport project is enough for commuter operation or not. Therefore, it is planned to procure additional rolling stock (DEMU). The cost shown in the sheet means the cost for the additional DEMU procurement.</p>				
<b>10) Expected Project Effect</b>				
<ul style="list-style-type: none"> <li>• To facilitate the modal shift from road to railway transport, especially CBD - Dagon Myothit direction transport.</li> <li>• To reduce road traffic volume and traffic congestions.</li> <li>• To improve the transport condition between Dagon Myothit and CBD area drastically, especially commuting condition.</li> </ul>				
<b>11) Needs/Request from Myanmar side</b>		<b>12) Relation with Other Projects</b>		
<p>Yangon-Mandalay Line Improvement project has been requested to Japanese side. Additional DEMU procurement is not requested yet.</p>		<p>[RL-04], [RL-05], [RL-07], [RL-14], [RL-16], [RL-17]</p>		
<b>13) Implementing Schedule</b>		<b>14) Rough Breakdown of Preliminary Construction Cost</b>		
<p>F/S: 6months            General procedure: 6months            Consultant employment: 6months            Design &amp; Tender Preparation: 12months            Tender Procedure: 12months            Construction &amp; Procurement: 24months</p>		<p>DEMU procurement: USD144mil. (=USD2mil./car x 6cars x 12trains)</p>		
<b>15) Beneficiaries</b>		<b>16) Impact to Environment (Natural/Social)</b>		
<p>Yangon-Mandalay Linesuburban section users.</p>		<p>No land acquisition and resettlement due to all work inside MR yard.            Some noise and vibration during construction.            Regarding additiional DEMU procurement, no negative impact.</p>		
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
<p>Yangon-Mandalay line suburban section</p>	 <p align="center">Source: YUTRA Project Team</p>			

**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
RL-14	Railway	<b>Malwagone Depot/Workshop Area Redevelopment Project (including Track Improvement between Yangon Central Station and Malwagone Station)</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		78 months	App. USD 2,684 mil.	Short
<b>8) Background/Current Issues</b> Malwagone depot/workshop, which is in the southern side of section between Puzundaung station and Malwagone station along Yangon-Mandalay line, is located at the eastern edge of CBD and has the largest area surrounded by wall with approximately 61ha although it includes many apartments/housings for MR staffs, stops, etc. This area has quite large potential to be developed as the large transport hub and commercial/business center due to the good location and large area, therefore it is expected any private investors express their interest to redevelop the yard.				
<b>9) Project Outline</b> The redevelopment plan should be prepared by selected developer from the commercial viewpoint, although layout of business offices, commercial facilities, residential apartments, etc. are expected. However, the redevelopment area will play roles as not only commercial and business center but also transit hub because the station accept entering many transit mode and pedestrians. In order to fulfill the function as transport hub, the following public functions and the integration should be considered. < Public Transport Transfer > MR lines (Yangon Circular Railway, Yangon Suburban Lines, Middle and Long Distance Trains), BRT station, Feeder bus terminal, Taxi stand < Private Vehicle Connection > Road connection including access rotary road to station entrance, bus terminal, and taxi stand, etc., Car parking for Park & Ride or commercial / business building users < Others > Pedestrian path, Green space				
<b>10) Expected Project Effect</b> The number of railway users including business/commercial area will be increased due to high ability to attract users and having high transport hub function.				
<b>11) Needs/Request from Myanmar side</b> No request from Myanmar side yet, but there are high possibility to express their interest due to obtaining development benefit.		<b>12) Relation with Other Projects</b> The redevelopment area currently has depot and workshop, etc. Necessary to relocate the functions to any substituted yard by [RL-15]. The relocation to be conducted by the development benefit. In addition, Result of SUDP, [RL-01], [RL-13].		
<b>13) Implementing Schedule</b> F/S and Tender Preparation: 5months Tender Procedure: 4months Design: 15months Construction & Procurement: 54months		<b>14) Rough Breakdown of Preliminary Construction Cost</b> a) Developed area: 61ha b) Unit cost for public infrastructure development: USD2mil./ha c) Unit building cost =10,000m <sup>2</sup> x 70% x building coverage ratio (50%) x floor area ratio (800%) x floor construction unit cost (US\$1500/m <sup>2</sup> )=USD42mil./ha d) Construction cost: 61ha x (USD2mil./ha + USD42mil./ha)=USD2,684mil.		
<b>15) Beneficiaries</b> MORT/MR, and Yangon Circular Railway users, especially Kyee Myin Daing Station users.		<b>16) Impact to Environment (Natural/Social)</b> In case of the redevelopment inside walled area, no land acquisition and resettlement is required. Some traffic jam, noise and vibration during construction.		
<b>17) Project Area</b> Malwagone depot/workshop area	<b>18) Location Map/Site Photo</b>  Source: YUTRA Project Team			



**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title	3) Project Type
RL-15	Railway	<b>New Integrated Depot and Workshop Construction Project (Integration and Relocation of Current Depots and Workshops to Yangon Suburban Area) :Phase2</b>	
4) Implementing Agency		5) Implementing Period	6) Preliminary Construction Cost
MORT/MR		42 months	App. USD 244 mil.
7) Term			Short

**8) Background/Current Issues**

According to a series of the railway yard redevelopments projects, these existing functions as depot and/or workshop should be relocated to any substituted yard. because these depot/workshop areas are also redeveloped to commercial and business area. From the above reasons, it is planned to establish a new integrated depot and workshop at the ourshirt of Yangon city.  
[RL-14] Malwagone Depot/Workshop Area Redevelopment Project is the one of them.

**9) Project Outline**

There is a huge land which is owned by MR at the northern side of Ywa Tar Gyi station along Yangon-Mandalay line. Therefore, it is proposed to use the yard for the project.  
The whole integrated new depot and workshop will be established by phasing development due to the difference of timing to redevelop each yards, and this project will be the 2nd phase for relocation of the existing in Malwagone depot and workshop yard. 61ha of Malwagone yard to be redeveloped, the required substitute land area is assumed as 61ha.  
The relocation cost to be born from the development benefit of Malwagone yard.

**10) Expected Project Effect**

Yard redevelopment projects can be implemented.  
Depot and workshop equipments and buildings are renewed.

**11) Needs/Request from Myanmar side**

No information about their interest to Japanese side yet.

**12) Relation with Other Projects**

[RL-14]

**13) Implementing Schedule**

F/S and Tender Preparation: 6months  
Tender Procedure: 6months  
Design: 12months  
Construction & Procurement: 18months

**14) Rough Breakdown of Preliminary Construction Cost**

a) Relocation area: 61ha  
b) Unit cost for depot/workshop development:USD4mil./ha  
c) Total=61ha x USD4mil./ha=USD244mil.

**15) Beneficiaries**

MORT/MR

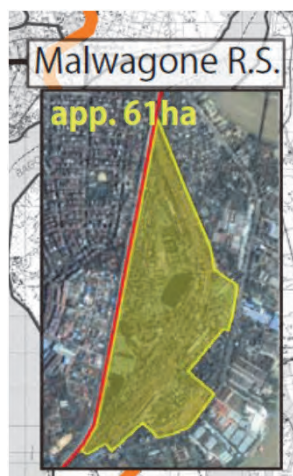
**16) Impact to Environment (Natural/Social)**

Some resettlement to be required although the land is owned by MR.  
Some traffic jam, noise and vibration during construction.  
Working place of labour is moved.

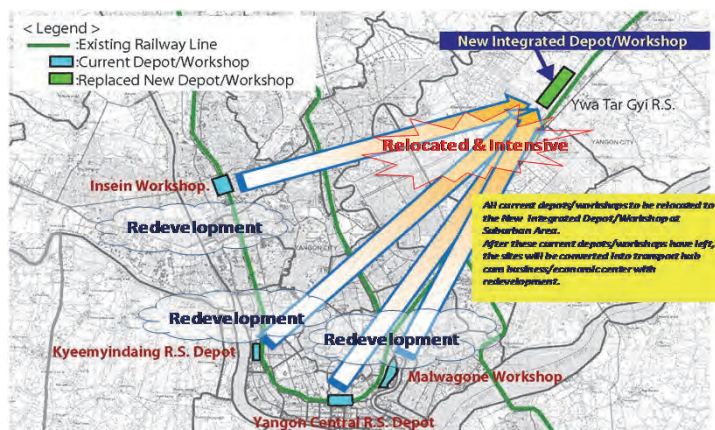
**17) Project Area**

Malwagone depot / workshop, and Ywa Tar Gyi station yard

**18) Location Map/Site Photo**




Source: YUTRA Project Team


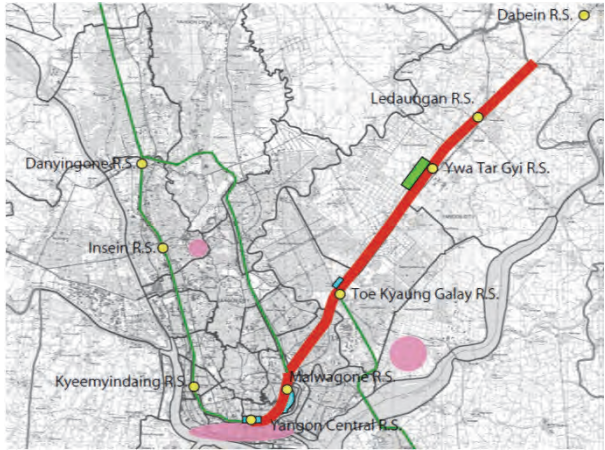




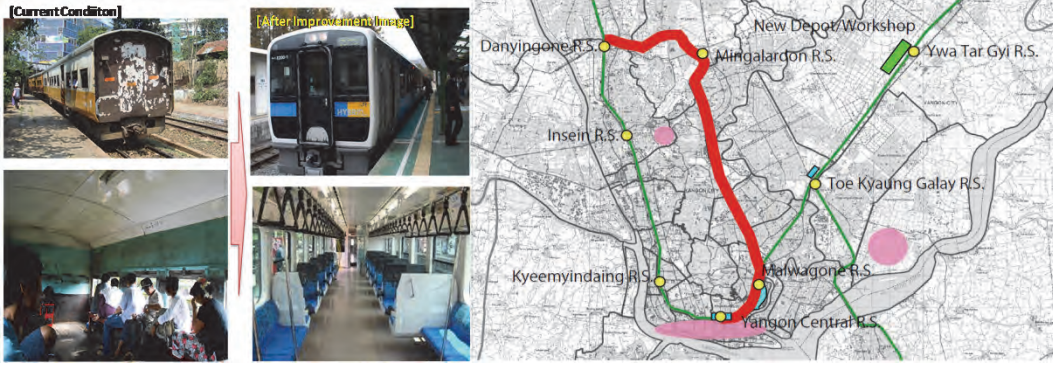
**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
RL-16	Railway	<b>Toe Kyaung Galay Station Development Project</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		42 months	App. USD 220 mil.	Short
<b>8) Background/Current Issues</b>				
<p>There are many potential lands for TOD along the existing railway, which do not belong to MR. These lands have many vacant lots currently due to far from CBD and having few bus services. However, the situation will be changed drastically after the modernization of the existing railways .because many trains for commuter are operated with high frequency, large transport capacity and high travel speed, high comfortability. Especially, Toe Kyaung Galay station along Yangon-Mandalay line is a one of the target stations in consideration of i) distance from CBD, ii) current vacant lots around station, and iii) future land use.</p>				
<b>9) Project Outline</b>				
<p>Toe Kyaung Galay station is approximately 10km to 15km far from CBD, is transfer station to Thilawa and UMRT line2, is located at the southern side of Dagon Myothit sub-center, and has plenty vacant land at the northern side. The redevelopment plan should be prepared by selected developer from the commercial viewpoint, although layout of business offices, commercial facilities, residential apartments, etc. are expected. However, the redevelopment area will play roles as not only commercial and business center but also transit hub because the station accept entering many transit mode and pedestrians. In order to fulfill the function as transport hub, the following public functions and the integration should be considered. It is recommended to conduct the project by PPP scheme in order to maximize use of private investor's fund.</p>				
<b>10) Expected Project Effect</b>				
<p>The number of railway users including business/commercial area will be increased due to high ability to attract users and having high transport hub function.</p>				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
<p>No request from Myanmar side yet, but there are high possibility to express their interest due to obtaining development benefit.</p>			<p>[RL-13], [RL-17], [RL-24]</p>	
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Construction Cost</b>	
<p>F/S and Tender Preparation: 5months Tender Procedure: 4months Design: 12months Construction &amp; Procurement: 21months</p>			<p>a) Developed area: 5ha (assumed) b) Unit cost for public infrastructure development: USD2mil./ha c) Unit building cost =10,000m<sup>2</sup> x 70% x building coverage ratio (50%) x floor area ratio (800%) x floor construction unit cost (US\$1500/m<sup>2</sup>)=USD42mil./ha d) Construction cost: 5ha x (USD2mil./ha + USD42mil./ha)=USD220mil.</p>	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
<p>MORT/MR, and Yangon-Mandalay line suburban section users, Thilawa line users, especially Toe Kyaung Galay Station users.</p>			<p>Land acquisition and resettlement is required. Some traffic jam, noise and vibration during construction.</p>	
<b>17) Project Area</b>		<b>18) Location Map/Site Photo</b>		
<p>Northern side of Toe Kyaung Galay station (Dagon Myothit sub-center)</p>		 <p>Source: YUTRA Project Team</p>		

**PROJECT SUMMARY SHEET**

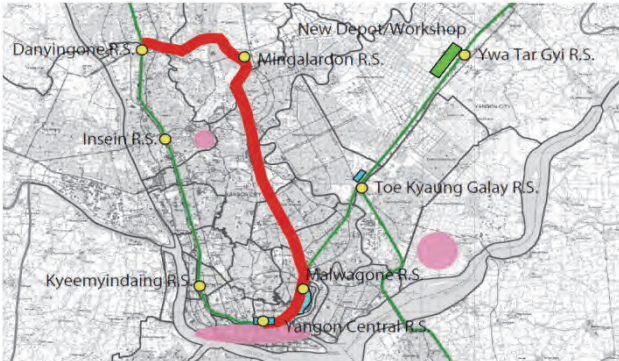
No.	1) Sector	2) Project Title		3) Project Type
RL-17	Railway	<b>Yangon-Mandalay Suburban Line Electrification</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		84 months	App. USD 425 mil.	Long
<b>8) Background/Current Issues</b> After the completion of “[RL-13] Yangon-Mandalay Line Improvement: Phase1”, the suburban section should be electrified in order to deal with the increasing demand for commuter. Note that the line will be on at-grade basis (without elevated work).				
<b>9) Project Outline</b> The project section, which is 28.3km from Yangon Central Station to the border of the study area (between Ledaungan Station and Dabein Station), is to be electrified as long-term project. Actual project implementation schedule should be reviewed by the possibility of stable power supply, budget allocation, etc.				
<b>10) Expected Project Effect</b> <ul style="list-style-type: none"> <li>• To assure the modal shift from road to railway transport, especially CBD - Dagon Myothit direction transport.</li> <li>• To reduce traffic congestions due to grade separation.</li> <li>• To improve the transport capacity and travel speed of the line.</li> </ul>				
<b>11) Needs/Request from Myanmar side</b> MR intend to improve the line although no mention about electrification.			<b>12) Relation with Other Projects</b> [RL-13]	
<b>13) Implementing Schedule</b> F/S: 12months General procedure: 6months Consultant employment: 6months Design & Tender Preparation: 18months Tender Procedure: 12months Construction & Procurement: 30months			<b>14) Rough Breakdown of Preliminary Construction Cost</b> - Unit cost to be electrified including all construction and procurement per km: USD15mil -USD15mil. X 28.3km = USD425mil.	
<b>15) Beneficiaries</b> All Yangon citizens, especially citizens living along the line.			<b>16) Impact to Environment (Natural/Social)</b> No land acquisition and resettlement due to almost work inside MR wall. Some noise and vibration during construction.	
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p align="center">&lt; Improved Image &gt;</p>  <p align="center"><b>Electrified/At-grade</b></p> <p align="center"><b>Electrified/At-grade with ROB</b></p> <p align="center">Source: YUTRA Project Team</p> </div> <div style="width: 45%;">  </div> </div>			

**PROJECT SUMMARY SHEET**


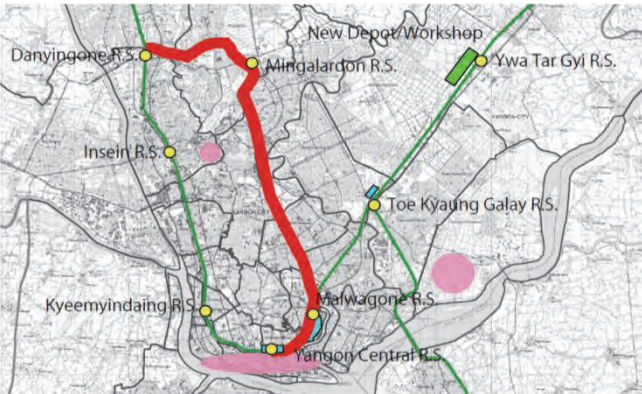
No.	1) Sector	2) Project Title		3) Project Type
RL-18	Railway	<b>Yangon Circular Railway Improvement (Non-electrified) Phase2: Eastern Half Loop</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		84 months	App. USD 568 mil.	Middle
<b>8) Background/Current Issues</b>				
<p>After the completion of “[RL-5] Yangon Circular Railway Improvement (Non-electrified) Phase1: Western Half Loop”, the remaining section, which is the eastern half of Yangon Circular Railway (Yangon Central Station – Malwagone Station – Mingalardon Station – Danyingone Station with 26km length) should be improved as Phase2 project.</p>				
<b>9) Project Outline</b>				
<p>The project scope is the same as “[RL-5] Yangon Circular Railway Improvement (Non-electrified) Phase1: Western Half Loop” as follows.</p> <ul style="list-style-type: none"> <li>• Civil Structure Improvement (Drainage Improvement, Embankment/Cut Improvement, Bridge Improvement, Culvert Improvement)</li> <li>• Track Improvement (Replace Rail from existing 37kg/m rail to 50kg/m rail, Install New PC sleeper for 50kg/m rail, Spread new ballast)</li> <li>• Signaling &amp; Telecom System Modernization</li> <li>• Station and Station Facility Improvement (High height platform, ticket selling system improvement, introduction of AFC system with IC card)</li> <li>• DEMU Procurement</li> <li>• Establishing new depot and maintenance shed for New DEMU.</li> <li>• Installation of automatic level crossing</li> </ul> <p>Note that no elevated and no electrified are applied.</p>				
<b>10) Expected Project Effect</b>				
<ul style="list-style-type: none"> <li>• To facilitate the modal shift from road to railway transport, especially the north - south direction transport.</li> <li>• To reduce road traffic volume and traffic congestions.</li> <li>• To improve the transport condition between the north Yangon and CBD area drastically, especially commuting condition.</li> </ul>				
<b>11) Needs/Request from Myanmar side</b>		<b>12) Relation with Other Projects</b>		
Myanmar minister express their request to Japanese minister.		[RL-05], [RL-19], [RL-20]		
<b>13) Implementing Schedule</b>		<b>14) Rough Breakdown of Preliminary Construction Cost</b>		
F/S: 10months General procedure: 6months Consultant employment: 8months Design & Tender Preparation: 18months Tender Procedure: 12months Construction & Procurement: 30months		- Track, Civil, Signal&Telecom, Station Improvement: USD15mil. x 26.5km=USD398mil. -DEMU procurement: USD120mil. (=USD2mil./car x 6cars x 10trains) -Upgrading depot/workshop: USD50mil.		
<b>15) Beneficiaries</b>		<b>16) Impact to Environment (Natural/Social)</b>		
All Yangon citizens, especially citizens living along the line.		No land acquisition and resettlement due to all work inside MR yard. Some noise and vibration during construction.		
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
Yangon Central Station - Yegu Station - Mingalardon Station - Danyingone Staiton	 <p>Source: YUTRA Project Team</p>			





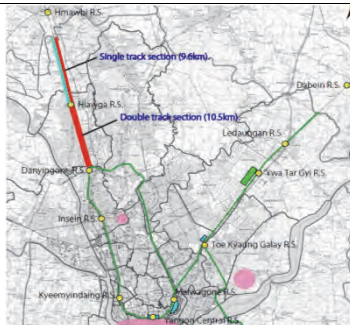
**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
RL-19	Railway	<b>Railway Land Redevelopment Project along Yangon Circular Railway Eastern-half</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		84 months	App. USD 1,100 mil.	Middle
<b>8) Background/Current Issues</b> The project named [RL-18] Yangon Circular Railway Improvement (Non-electrified) Phase2: Eastern Half Loop provides high frequency, high travel speed, high comfortability and high safety transit mode to the people living along the line. However, it is not enough for the people due to poor access to railway stations. The line has a plenty vacant lots which are suitable for station plaza development project in order to enhance the ability to attract users. Therefore, it is expected that private developers will express their interests in the development when [RL-18] project is proceeded.				
<b>9) Project Outline</b> The redevelopment plan should be prepared by selected developer from the commercial viewpoint, although layout of business offices, commercial facilities, residential apartments, etc. are expected. However, the redevelopment area will play roles as not only commercial and business center but also transit hub because the station accept entering many transit mode and pedestrians. In order to fulfill the function as transport hub, the following public functions and the integration should be considered. < Public Transport Transfer >: MR lines, UMRT Line1 and Line2, BRT stations, Feeder bus terminal, Taxi stand < Private Vehicle Connection >: Road connection including access rotary road to station entrance, bus terminal, and taxi stand, etc., Car parking for Park & Ride or commercial / business building users < Others >: Pedestrian path, Green space It is recommended to conduct the project by PPP scheme in order to maximize use of private investor's fund.				
<b>10) Expected Project Effect</b> The number of railway users including business/commercial area will be increased due to high ability to attract users and having high transport hub function.				
<b>11) Needs/Request from Myanmar side</b> No request from Myanmar side yet, but there are high possibility to express their interest due to obtaining development benefit.			<b>12) Relation with Other Projects</b> [RL-18], [RL-20]	
<b>13) Implementing Schedule</b> F/S: 10months General procedure: 6months Consultant employment: 8months Design & Tender Preparation: 18months Tender Procedure: 12months Construction & Procurement: 30months			<b>14) Rough Breakdown of Preliminary Construction Cost</b> a) Developed area: assumed as 5 places x 5ha =25ha. b) Unit cost for public infrastructure development: USD2mil./ha c) Unit building cost =10,000m <sup>2</sup> x 70% x building coverage ratio (50%) x floor area ratio (800%) x floor construction unit cost (US\$1500/m <sup>2</sup> )=USD42mil./ha d) Construction cost: 25ha x (USD2mil./ha + USD42mil./ha)=USD1,100mil.	
<b>15) Beneficiaries</b> MORT/MR, and Yangon Circular Railway users.			<b>16) Impact to Environment (Natural/Social)</b> Land acquisition and resettlement is required. Some traffic jam, noise and vibration during construction.	
<b>17) Project Area</b> Lands along Yangon Circular Railway Eastern Half		<b>18) Location Map/Site Photo</b>  Source: YUTRA Project Team		

**PROJECT SUMMARY SHEET**

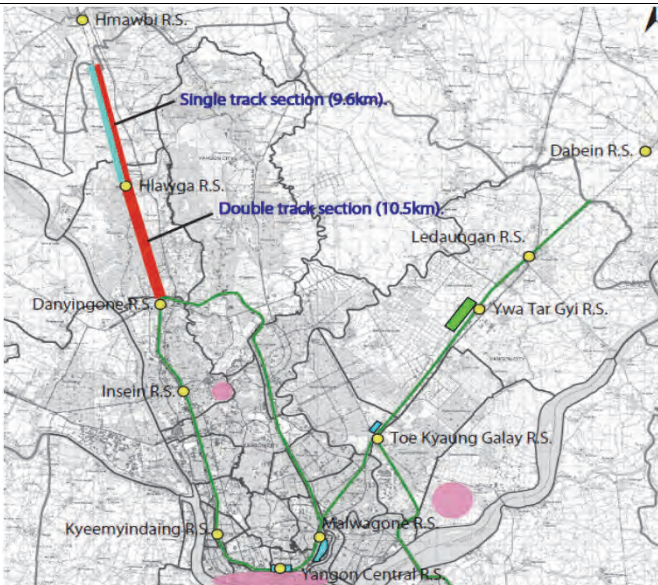
No.	1) Sector	2) Project Title		3) Project Type
RL-20	Railway	<b>Electrification of Yangon Circular Railway Eastern Half</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		96 months	App. USD 398 mil.	Long
<b>8) Background/Current Issues</b> After the completion of “[RL-12] Electrified and Elevated Project for Yangon Circular Railway Western Half”, the remaining section of Yangon Circular Railway should be electrified at-grade basis in order to deal with the increasing demand for commuter. (without elevated work).				
<b>9) Project Outline</b> The project section, which is the eastern half of Yangon Circular Railway (Yangon Central Station – Malwagone Station – Mingalardon Station – Danyingone Station with 26.5km length), is to be electrified as long-term project. Actual project implementation schedule should be reviewed by the possibility of stable power supply, budget allocation, etc.				
<b>10) Expected Project Effect</b> <ul style="list-style-type: none"> <li>• To assure the modal shift from road to railway transport, especially the north - south direction transport.</li> <li>• To reduce traffic congestions due to grade separation.</li> <li>• To improve the transport capacity and travel speed of the line.</li> </ul>				
<b>11) Needs/Request from Myanmar side</b> MR intend to improve the line although no mention about electrification.			<b>12) Relation with Other Projects</b> [RL-18], [RL-19]	
<b>13) Implementing Schedule</b> F/S: 12months General procedure: 6months Consultant employment: 6months Design & Tender Preparation: 18months Tender Procedure: 12months Construction & Procurement: 30months			<b>14) Rough Breakdown of Preliminary Construction Cost</b> - Unit cost to be electrified including all construction and procurement per km: USD15mil -USD15mil. X 26.5km = USD398mil.	
<b>15) Beneficiaries</b> All Yangon citizens, especially citizens living along the line.			<b>16) Impact to Environment (Natural/Social)</b> No land acquisition and resettlement due to almost work inside MR wall. Some noise and vibration during construction.	
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
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**PROJECT SUMMARY SHEET**


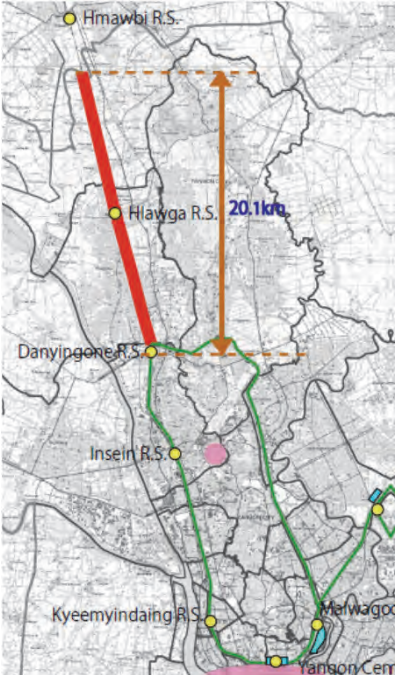
No.	1) Sector	2) Project Title		3) Project Type
RL-21	Railway	<b>Yangon-Pyay Suburban Line Improvement and Double-tracking (between Danyingone R.S and Hmawbi R.S)</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		84 months	App. USD 500 mil.	Middle
<b>8) Background/Current Issues</b>				
Yangon-Pyay suburban line can be recognized as “the extension line of the western half of Yangon Circular Railway” judging from the actual location, and therefore the line should be improved in order to fulfill transport capacity enhancement and operational speed improvement.				
<b>9) Project Outline</b>				
<p>Although the line has 20.1km from Danyingone station to the border of the Study area near Hmawbi station, the half of them (9.6km from Hlawga Station to the border of the study area near Hmawbi station) is single track. The section should be double-tracked in order to increase train operation capacity in addition to improvement of the existing track.</p> <p>The other scope is as follows.</p> <ul style="list-style-type: none"> <li>• Civil Structure Improvement (Drainage Improvement, Embankment/Cut Improvement, Bridge Improvement, Culvert Improvement)</li> <li>• Track Improvement (Replace Rail from existing 37kg/m rail to 50kg/m rail, Install New PC sleeper for 50kg/m rail, Spread new ballast)</li> <li>• Signaling &amp; Telecom System Modernization</li> <li>• Station and Station Facility Improvement (High height platform, ticket selling system improvement, introduction of AFC system with IC card)</li> <li>• DEMU Procurement</li> <li>• New depot and workshop for new DEMU</li> <li>• Installation of automatic level crossing</li> </ul>				
<b>10) Expected Project Effect</b>				
<ul style="list-style-type: none"> <li>• To enhance the modal shift from road to railway transport, especially the north - south direction transport.</li> <li>• To reduce road traffic volume and traffic congestions.</li> <li>• To improve the transport condition between the northern ourshirt of Yangon and CBD area drastically, especially commuting condition.</li> </ul>				
<b>11) Needs/Request from Myanmar side</b>		<b>12) Relation with Other Projects</b>		
No request from Myanmar side yet, but actual need is high due to expansion of the city.		[RL-05], [RL-22], [RL-23]		
<b>13) Implementing Schedule</b>		<b>14) Rough Breakdown of Preliminary Construction Cost</b>		
F/S: 10months General procedure: 6months Consultant employment: 8months Design & Tender Preparation: 18months Tender Procedure: 12months Construction & Procurement: 30months		a) Track, Civil, Signal&Telecom, Station Improvement for Current Double Track Section: USD15mil. x 10.5km=USD157.5mil. b) Track, Civil, Signal&Telecom, Station Improvement for Current Single Track Section: USD8mil. x 9.6km=USD76.5mil. c) Track Doubling for Current Single Track Section: USD10mil. x 9.6km=USD96mil. d) DEMU procurement: USD120mil. (=USD2mil./car x 6cars x 10trains) e) Upgrading depot/workshop: USD50mil.		
<b>15) Beneficiaries</b>		<b>16) Impact to Environment (Natural/Social)</b>		
All Yangon citizens, especially citizens living along the line.		Some land acquisition and resettlement may be required for double tracking. Some noise and vibration during construction.		
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
Yangon-Pyay suburban line (Danyingone-the border of the Study area near Hmawbi station)	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>[Current Condition]</b></p>  </div> <div style="text-align: center;"> <p><b>[After Improvement (Image)]</b></p>  </div> </div> <div style="text-align: center; margin-top: 10px;">  </div> <p align="center">Source: YUTRA Project Team</p>			







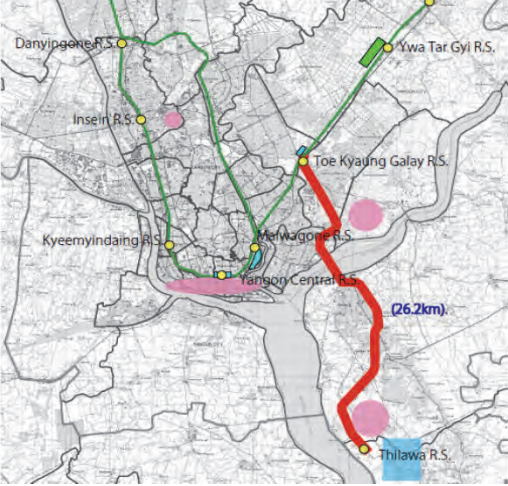
**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
RL-22	Railway	<b>Hlawga Station Development</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		42 months	App. USD 220 mil.	Middle
<b>8) Background/Current Issues</b>				
<p>There are many potential lands for TOD along the existing railway, which do not belong to MR. These lands have many vacant lots currently due to far from CBD and having few bus services. However, the situation will be changed drastically after the modernization of the existing railways .because many trains for commuter are operated with high frequency, large transport capacity and high travel speed, high comfortability. Especially,Hlawga station along Yangon-Pyay line is a one of the target stations in consideration of i) distance from CBD, ii) current vacant lots around station, and iii) future land use.</p>				
<b>9) Project Outline</b>				
<p>Hlawga station is located near new town core and new industrial zone planned in SUDP and has plenty vacant land, although the distance from/to CBD is approximately 30km..</p> <p>The redevelopment plan should be prepared by selected developer from the commercial viewpoint, although layout of business offices, commercial facilities, residential apartments, etc. are expected. However, the redevelopment area will play roles as not only commercial and business center but also transit hub because the station accept entering many transit mode and pedestrians. In order to fulfill the function as transport hub, the following public functions and the integration should be considered.</p> <p>It is recommended to conduct the project by PPP scheme in order to maximize use of private investor's fund.</p>				
<b>10) Expected Project Effect</b>				
<p>The number of railway users including business/commercial area will be increased due to high ability to attract users and having high transport hub function.</p>				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
<p>No request from Myanmar side yet, but there are high possibility to express their interest due to obtaining development benefit.</p>			<p>[RL-21], [RL-23]</p>	
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Construction Cost</b>	
<p>F/S and Tender Preparation: 5months  Tender Procedure: 4months  Design: 12months  Construction &amp; Procurement: 21months</p>			<p>a) Developed area: 5ha (assumed)  b) Unit cost for public infrastructure development: USD2mil./ha  c) Unit building cost =10,000m<sup>2</sup> x 70% x building coverage ratio (50%) x floor area ratio (800%) x floor construction unit cost (US\$1500/m<sup>2</sup>)=USD42mil./ha  d) Construction cost: 5ha x (USD2mil./ha + USD42mil./ha)=USD220mil.</p>	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
<p>MORT/MR, and Yangon-Pyay line suburban section users, especially Hlawga Station users.</p>			<p>Land acquisition and resettlement is required.  Some traffic jam, noise and vibration during construction.</p>	
<b>17) Project Area</b>		<b>18) Location Map/Site Photo</b>		
<p>Around Hlawga station</p>		 <p>Source: YUTRA Project Team</p>		

**PROJECT SUMMARY SHEET**


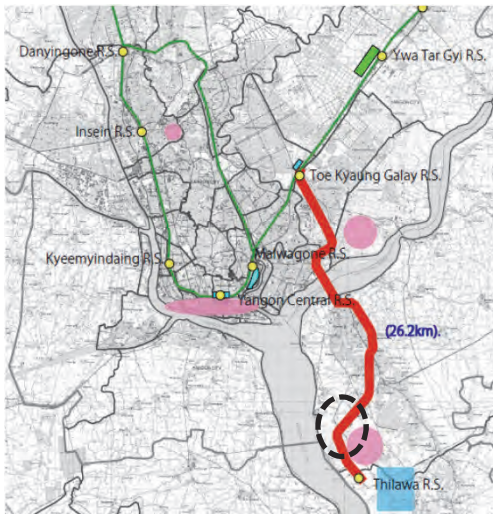
No.	1) Sector	2) Project Title		3) Project Type
RL-23	Railway	Yangon-Pyay Suburban Line Electrification		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		84 months	App. USD 302 mil.	Long
<b>8) Background/Current Issues</b>				
<p>After the completion of “[RL-21] Yangon-Pyay Suburban Line Improvement and Double-Tracking”, the suburban section should be electrified in order to deal with the increasing demand for commuter. Note that the line will be on at-grade basis (without elevated work).</p>				
<b>9) Project Outline</b>				
<p>The project section, which is 20.1km from Danyingone Station to the border of the study area (between Hlawga Station and Hmawbi Station), is to be electrified as long-term project. Actual project implementation schedule should be reviewed by the possibility of stable power supply, budget allocation, etc.</p>				
<b>10) Expected Project Effect</b>				
<ul style="list-style-type: none"> <li>• To assure the modal shift from road to railway transport, especially the north - south direction transport.</li> <li>• To reduce road traffic volume and traffic congestions more.</li> <li>• To improve the transport capacity and travel speed between the northern ourshirt of Yangon and CBD area more, especially commuting condition.</li> </ul>				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
No request from Myanmar side yet, but actual need is high due to expansion of the city.			[RL-21], [RL-22]	
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Construction Cost</b>	
F/S: 12months General procedure: 6months Consultant employment: 6months Design & Tender Preparation: 18months Tender Procedure: 12months Construction & Procurement: 30months			- Unit cost to be electrified including all construction and procurement per km: USD15mil -USD15mil. X 20.1km = USD302mil.	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
All Yangon citizens, especially citizens living along the line.			No land acquisition and resettlement due to almost work inside MR wall. Some noise and vibration during construction.	
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
20.1km from Danyingone Station to the border of the study area (between Hlawga Station and Hmawbi Station) in Yangon-Pyay line	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p data-bbox="406 1373 614 1400">&lt; Improved Image &gt;</p>  <p data-bbox="448 2056 703 2078">Source: YUTRA Project Team</p> </div> <div style="width: 50%;">  </div> </div>			

**PROJECT SUMMARY SHEET**



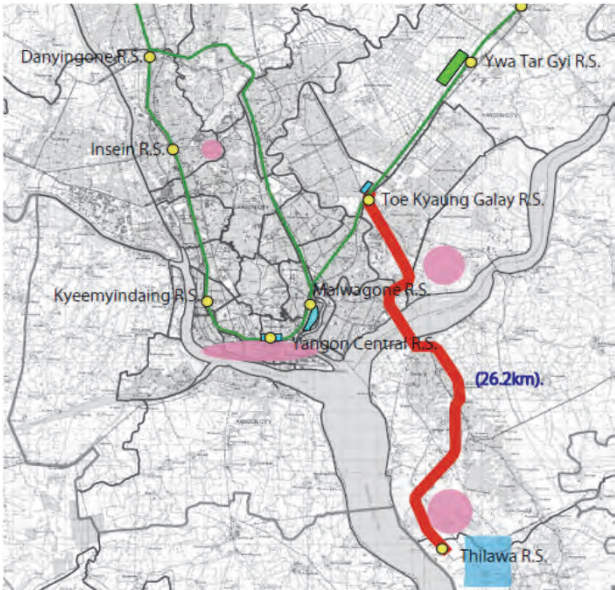
No.	1) Sector	2) Project Title		3) Project Type
RL-24	Railway	<b>Thilawa Access Line Improvement and Double-tracking (for Commuter and Freight)</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		84 months	App. USD 766 mil.	Middle
<b>8) Background/Current Issues</b> Thilawa access line will be the important line for both commuter and freight transport due to the future development of Thilawa area as a main port, huge SEZ, and a one of sub-center in Yangon. However, the current access railway line to Thilawa is single track and quite poor condition due to the lack of maintenance, old-fashioned safety devices, etc.				
<b>9) Project Outline</b> To improve and double-track the existing line which has 26.2km from Toe Kyaung Galay station to Thilawa station. Regarding the double-tracking, it will be a one of main issues that how to across Bago river due to the long length with approximately 2km. There is a problem in the existing Thanlyin bridge across Bago river that any container train cannot pass due to the small construction gauge and car gauge. Therefore, all freight container train should pass the new railway bridge, and the existing bridge will be for commuter/passenger train.				
<b>10) Expected Project Effect</b> <ul style="list-style-type: none"> <li>• To facilitate the modal shift from road to railway transport, both passenger transport between Yangon and Thilawa and freight transport between Thilawa and Mandalay, etc.</li> <li>• To reduce road traffic volume and traffic congestions.</li> <li>• To improve the transport condition between Yangon and Thilawa drastically, especially commuting condition.</li> </ul>				
<b>11) Needs/Request from Myanmar side</b> No request from Myanmar side yet, but actual need is high because it is the one of keys to succeed in Thilawa development.		<b>12) Relation with Other Projects</b> [RL-13], [RL-25], [RL-26], the other Thilawa related projects.		
<b>13) Implementing Schedule</b> F/S: 12months General procedure: 6months Consultant employment: 6months Design & Tender Preparation: 18months Tender Procedure: 12months Construction & Procurement: 30months		<b>14) Rough Breakdown of Preliminary Construction Cost</b> a) Track, Civil, Signal&Telecom, Station Improvement for Current Single Track Section: USD8mil. x 26.2km=USD210mil. b) Track Doubling for Current Single Track Section: USD10mil. x 26.2km=USD262mil. c) New bridge across Bago river: assumed as USD100mil. d) DEMU procurement: USD144mil. (=USD2mil./car x 6cars x 12trains) e) New depot/workshop: USD50mil.		
<b>15) Beneficiaries</b> All Yangon citizens, especially citizens living along the line. Freight companies.		<b>16) Impact to Environment (Natural/Social)</b> Some land acquisition and resettlement may be required for double tracking. Some noise and vibration during construction.		
<b>17) Project Area</b> Thilawa access line with 26.2km from Toe Kyaung Galay station to Thilawa station.	<b>18) Location Map/Site Photo</b> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>[Current Condition]</b></p>  </div> <div style="text-align: center;"> <p><b>[After Improvement/Upgrade]</b></p>  </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> <div style="text-align: right; margin-top: 10px;">  </div>			





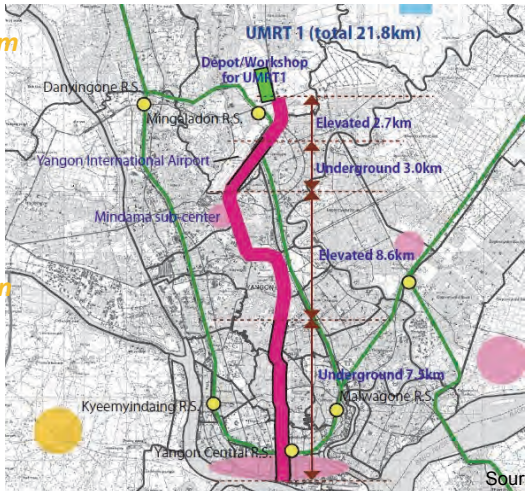
**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
RL-25	Railway	<b>Thilawa New Container Railway Station Development Project</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		84 months	App. USD 40 mil.	Middle
<b>8) Background/Current Issues</b> Container volume treated in Thilawa will be increased due to the development of port and SEZ, etc. It means there is a potential demand to use Thilawa access line as freight line. Thilawa access line will be improved by [RL-24]: Thilawa Access Line Improvement and Double-tracking (for Commuter and Freight), therefore, a new freight container station in Thilawa should be established in order to attract freight company to railway and induce modal shift from road to railway.				
<b>9) Project Outline</b> To construct railway container terminal with railway station at appropriate area along Thilawa line.				
<b>10) Expected Project Effect</b> <ul style="list-style-type: none"> <li>• To facilitate the modal shift of container transport from road to railway transport between Thilawa and remote inland cities such as Mandalay, etc.</li> <li>• To reduce road traffic volume and traffic congestions.</li> </ul>				
<b>11) Needs/Request from Myanmar side</b> No request from Myanmar side yet, but actual need is high because it is the one of keys to succeed in Thilawa development.			<b>12) Relation with Other Projects</b> [RL-24]	
<b>13) Implementing Schedule</b> F/S: 12months General procedure: 6months Consultant employment: 6months Design & Tender Preparation: 18months Tender Procedure: 12months Construction & Procurement: 30months			<b>14) Rough Breakdown of Preliminary Construction Cost</b> a) Station area: assumed as 40ha b) Unit cost per ha : assumed as USD1mil./ha c) Total=10ha x USD1mil./40ha=USD40mil.	
<b>15) Beneficiaries</b> MR/MORT, Freight companies.			<b>16) Impact to Environment (Natural/Social)</b> Some land acquisition and resettlement may be required. Some noise and vibration during construction.	
<b>17) Project Area</b> Near Thilawa station along Thilawa line.	<b>18) Location Map/Site Photo</b> <div style="display: flex; align-items: flex-start;"> <div style="flex: 1;"> <p align="center">&lt; Improved Image &gt;</p>  <p align="center">Source: YUTRA Project Team</p> </div> <div style="flex: 2;">  </div> </div>			

**PROJECT SUMMARY SHEET**



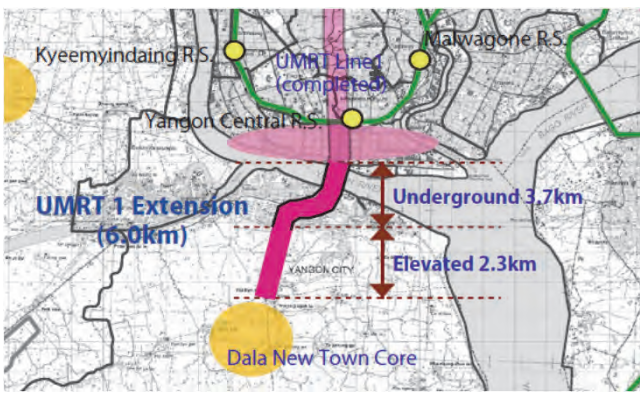
No.	1) Sector	2) Project Title		3) Project Type
RL-26	Railway	<b>Thilawa Access Line Electrification</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
MORT/MR		84 months	App. USD 393 mil.	Long
<b>8) Background/Current Issues</b> After the completion of “[RL-24] Thilawa Access Line Improvement and Double-tracking”, the section should be electrified in order to deal with the increasing demand for passenger. Note that the line will be on at-grade basis (without elevated work).				
<b>9) Project Outline</b> The project section, is 26.2km from Toe Kyaung Galay station to Thilawa Station, is to be electrified as long-term project. Actual project implementation schedule should be reviewed by the possibility of stable power supply, budget allocation, etc.				
<b>10) Expected Project Effect</b> <ul style="list-style-type: none"> <li>• To assure the modal shift from road to railway transport, especially commuter from/to Thilawa.</li> <li>• To reduce road traffic volume and traffic congestions more.</li> <li>• To improve the transport capacity and travel speed between Yangon and Thilawa, especially commuting condition.</li> </ul>				
<b>11) Needs/Request from Myanmar side</b> No request from Myanmar side yet, but actual need is high due to expansion of the city.			<b>12) Relation with Other Projects</b> [RL-17], [RL-24]	
<b>13) Implementing Schedule</b> F/S: 12months General procedure: 6months Consultant employment: 6months Design & Tender Preparation: 18months Tender Procedure: 12months Construction & Procurement: 30months			<b>14) Rough Breakdown of Preliminary Construction Cost</b> - Unit cost to be electrified including all construction and procurement per km: USD15mil -USD15mil. X 26.2km = USD393mil.	
<b>15) Beneficiaries</b> All Yangon citizens, especially citizens living along the line.			<b>16) Impact to Environment (Natural/Social)</b> No land acquisition and resettlement due to almost work inside MR wall. Some noise and vibration during construction.	
<b>17) Project Area</b> Thilawa access line with 26.2km from Toe Kyaung Galay station to Thilawa station.	<b>18) Location Map/Site Photo</b> < Improved Image > <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p><b>Electrified/At-grade</b></p> </div> <div style="text-align: center;">  <p><b>Electrified/At-grade with RO&amp;B</b></p> </div> <div style="text-align: center;">  </div> </div> <p align="center">Source: YUTRA Project Team</p>			

**PROJECT SUMMARY SHEET**



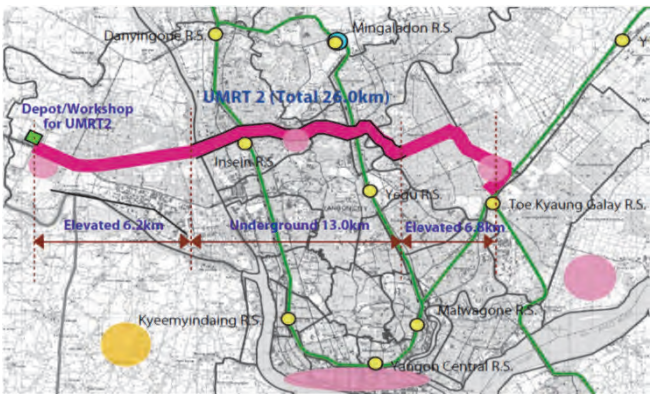
No.	1) Sector	2) Project Title		3) Project Type
RL-27	Railway	<b>UMRT Line1 Construction Project (North-South Line)</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
YUTA (to be established newly)		126 months	App. USD 2,253 mil.	Middle
<b>8) Background/Current Issues</b>				
Judging from the future population increase with increasing the number of trip, it is essential to install Urban Mass Rapid Transit (UMRT) with high speed, high frequency, and high transport capacity, in addition to the existing railway modernization.				
<b>9) Project Outline</b>				
<p>UMRT Line 1 is planned to install one of North-South axis which have many traffic volume for commuter. The line connecting CBD with Yangon International Airport with 21.8km length via Yangon Central Station and Mindama sub-center area, along Sule Pagoda Rd., Kaba Aye Rd., Yangon Airport Rd., and NH No.3.</p> <p>In order to save construction cost, underground section is minimized. However, 10.5km length becomes underground section due to no room for elevated viaduct construction. Two sections that i) 7.5km from the starting point which is the intersection of Strand Rd. and Sule Pagoda Rd. to the east side of Inya lake, and ii) 3.0km along the southeast side of Yangon International Airport are planed as underground section. The other sections are planed as elevated. The depot and workshop will locate at the north end of the line judging from the current plenty vacant lot.</p>				
<b>10) Expected Project Effect</b>				
<ul style="list-style-type: none"> <li>- Improve passenger transport capacity and travel speed of north-south axis of the city.</li> <li>- Another alternative route for north-south direction is provided.</li> <li>- Land development along the line, especially Mindama sub-center, is accelerated</li> </ul>				
<b>11) Needs/Request from Myanmar side</b>		<b>12) Relation with Other Projects</b>		
No request from Myanmar side yet, but actual need is high due to increasing trip of the city.		[RL-07], [RL-28], [RL-29]		
<b>13) Implementing Schedule</b>		<b>14) Rough Breakdown of Preliminary Construction Cost</b>		
F/S: 12months General procedure: 6months Consultant employment: 6months Design & Tender Preparation: 18months Tender Procedure: 12months Construction & Procurement: 72months		a) Unit cost for Underground Section (including all construction and procurement): USD150mil./km b) Unit cost for Elevated Section (including all construction and procurement): USD60mil./km c) 10.5km x USD150mil./km + 11.3km x USD60mil./km = USD2,253mil.		
<b>15) Beneficiaries</b>		<b>16) Impact to Environment (Natural/Social)</b>		
All Yangon Citizens, especially public transport users.		Large impact to both natural and social environment is expected due to heavy traffic jam, noise and vibration during construction, and large scale land acquisition and resettlement.		
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
CBD - the north of Yangon International Airport with 21.8km length via Yangon Central Station and Mindama sub-center area, along Sule Pagoda Rd., Kaba Aye Rd., Yangon Airport Rd., and NH No.3.	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <p>&lt; Improved Image &gt;</p> <p><i>Underground station platform</i></p>  <p><i>Elevated section with station</i></p>  </div> <div>  <p align="right">Source: YUTRA Project Team</p> </div> </div>			





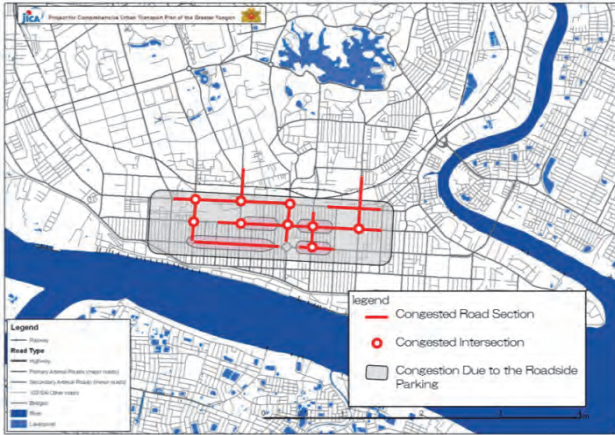
**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
RL-28	Railway	<b>UMRT Line1 Extension Project (North-South Line Extension)</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
YUTA (to be established newly)		102 months	App. USD 693 mil.	Long
<b>8) Background/Current Issues</b>				
Judging from the future population increase with increasing the number of trip, it is essential to install Urban Mass Rapid Transit (UMRT) with high speed, high frequency, and high transport capacity, in addition to the existing railway modernization.				
<b>9) Project Outline</b>				
The project is to extend UMRT Line1 from the south end to Dala with 6km length. In order to save construction cost, underground section is minimized. However, 3.7km length becomes underground section due to across Hlaing river and no room for elevated viaduct construction around the river side of Dala.				
<b>10) Expected Project Effect</b>				
- Large public transport corridor can be provided from/to Dala - Land development along the line, especially Dala is accelerated				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
No request from Myanmar side yet, but actual need is high due to increasing trip of the city.			[RL-27]	
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Construction Cost</b>	
F/S: 12months General procedure: 6months Consultant employment: 6months Design & Tender Preparation: 18months Tender Procedure: 12months Construction & Procurement: 48months			a) Unit cost for Underground Section (including all construction and procurement): USD150mil./km b) Unit cost for Elevated Section (including all construction and procurement): USD60mil./km c) 3.7km x USD150mil./km + 2.3km x USD60mil./km = USD693mil.	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
All Yangon Citizens, especially people living Dala.			Large impact to both natural and social environment is expected due to heavy traffic jam, noise and vibration during construction, and large scale land acquisition and resettlement.	
<b>17) Project Area</b>		<b>18) Location Map/Site Photo</b>		
CBD - Dala 6.0 21.8km length.		<p align="center">&lt; Improved Image &gt;</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><i>Underground station platform</i></p>  </div> <div style="text-align: center;"> <p><i>Elevated section with station</i></p>  </div> </div> <div style="text-align: center; margin-top: 10px;">  </div> <p align="right">Source: YUTRA Project Team</p>		

**PROJECT SUMMARY SHEET**



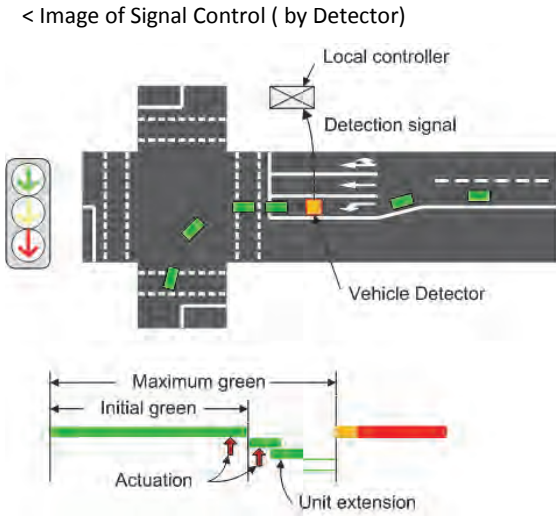
No.	1) Sector	2) Project Title		3) Project Type
RL-29	Railway	<b>UMRT Line2 Construction Project (East-West Line)</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
YUTA (to be established newly)		126 months	App. USD 2,730 mil.	Long
<b>8) Background/Current Issues</b>				
Judging from the future population increase with increasing the number of trip, it is essential to install Urban Mass Rapid Transit (UMRT) with high speed, high frequency, and high transport capacity, in addition to the existing railway modernization.				
<b>9) Project Outline</b>				
UMRT Line2 is installed as East-West axis with 26.0km length. The route is planned to connect sub-centers planned by SUDP, named Hlaing Tharya, Mindama, and Dagon Myothit. In order to save construction cost, underground section is minimized. However, 13.0km length becomes underground section due to no room for elevated viaduct construction. Two sections that i) 6.2km from the starting point which is located beside Hlaing Tharya. Sub-center to the west bank side of Aung Zay Ya bridge, and ii) 6.8km from near the west end of Yarzaa Dirit Rd. to the end point beside Toe Kyaung Galay station are planned as elevated section. The other sections are planned as underground. The depot and workshop is planned to locate at the beside Hlaing Tharya sub-center judging from the current plenty vacant lot.				
<b>10) Expected Project Effect</b>				
<ul style="list-style-type: none"> <li>- All sub-centers are connected by railway</li> <li>- Improve passenger transport capacity and travel speed of East-West axis of the city.</li> <li>- Land development along the line is accelerated</li> </ul>				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
No request from Myanmar side yet, but actual need is high due to increasing trip of the city.			[RL-27]	
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Construction Cost</b>	
F/S: 12months General procedure: 6months Consultant employment: 6months Design & Tender Preparation: 18months Tender Procedure: 12months Construction & Procurement: 72months			a) Unit cost for Underground Section (including all construction and procurement): USD150mil./km b) Unit cost for Elevated Section (including all construction and procurement): USD60mil./km c) 13km x USD150mil./km + 13km x USD60mil./km = USD2,730mil.	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
All Yangon Citizens, especially public transport users.			Large impact to both natural and social environment is expected due to heavy traffic jam, noise and vibration during construction, and large scale land acquisition and resettlement.	
<b>17) Project Area</b>		<b>18) Location Map/Site Photo</b>		
Connect sub-centers, Hlaing Tharya, Mindama, and Dagon Myothit.		<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p align="center">&lt; Improved Image &gt;</p>  <p align="center"><i>Underground station platform</i></p>  <p align="center"><i>Elevated section with station</i></p> </div> <div style="width: 50%;">  <p align="center">Source: YUTRA Project Team</p> </div> </div>		

**PROJECT SUMMARY SHEET**




No.	1) Sector	2) Project Title		3) Project Type
TMS-01	Traffic Management and Safety	Yangon CBD Traffic Congestion Mitigation Project		
4) Implementing Agency		5) Implementing Period	6) Preliminary Construction Cost	7) Term
YCDC		36 months	App. JPY 500 mil.	Urgent
<b>8) Background/Current Issues</b>				
Rapid expansion of the motorization has been deteriorated traffic situation in CBD since vehicle import regulation was eased and become social problem in Yangon. Cause of the congestion is not only increased number of vehicles, but also on-street parking, street vendors, insufficient traffic signals and reckless operation behavior of buses. Therefore in order to mitigate the traffic congestions, it is necessary to formulate comprehensive measures including physical improvement, management enhancement and propaganda activities.				
<b>9) Project Outline</b>				
<ul style="list-style-type: none"> <li>- Modernization of the signal system</li> <li>- Remove on-street parking from the congested road sections, provide sufficient number of lots to less-congested sections</li> <li>- Parking Fee charging system (including parking meter)</li> <li>- Remove street vendors from foot path and develop a Hawker Centre, and improve pedestrian environment</li> <li>- Provision of bus-bays and taxi-bays</li> <li>- Implementation of Mobility Management Measures (TDM measures)</li> </ul>				
<b>10) Expected Project Effect</b>				
the project will contribute to mitigate traffic congestions in CBD so as to enhance economic activities and to improve urban environment.				
<b>11) Needs/Request from Myanmar side</b>		<b>12) Relation with Other Projects</b>		
one of the important social issues in national level		TMS-2 and TMS-3 Proposed Traffic Planning and Management Unit will responsible to manage this project.		
<b>13) Implementing Schedule</b>		<b>14) Rough Breakdown of Preliminary Project Cost</b>		
a) Feasibility Study: Apr.2014 to June 2014 b) Basic Design, Detail Design, Tender Document Preparation July 2014 to Nov. 2014 c) Tendering: Dec. 2014 d) Construction, Procurement, Installation: Jan. 2015 to Dec. 2015 e) Completion of the Project: Dec. 2015		a) Remove on-street parking and street vendors and resurfacing: JPY 150 mil b) Upgrading traffic signal system (20 location) including intersection geometric improvement JPY 200 mil c) installation of bus and taxi bays and signs JPY 50 mil d) Propaganda activities JPY 50 mil e) Engineering Cost JPY 50 mil f) Total project cost JPY 500 mil		
<b>15) Beneficiaries</b>		<b>16) Impact to Environment (Natural/Social)</b>		
All Yangon Citizen (especially living and working in CBD)		no adverse impact but need careful attention to the street vendors		
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
Yangon CBD	<p>&lt; Current Situation A&gt; &lt; Location Map&gt;</p>  <p>Source: YUTRA Project Team</p> <p>&lt; Current Situation B&gt;</p>  <p>Source: YUTRA Project Team</p>  <p>Source: YUTRA Project Team</p>			






**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
TMS-02	Traffic Management and Safety	Yangon Main Roads Traffic Congestion Mitigation Project		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
Yangon Region/YCDC		30 months	App. USD 17 mil.	Short
<b>8) Background/Current Issues</b>				
<p>Traffic congestions are not only in the CBD, but also major intersections outside of CBD are seriously congested. Many causes of the congestions can be seen but mainly insufficient signal operation. Impact of upgrading signal system is demonstrated in the social experimental project on 8-mil intersection sponsored by JICA. After replacing with the advanced signal system, the congestion is tremendously improved. In addition intersection grade separation projects are implemented by Myanmar government at the three most congested intersections. however, impact of the independent project at specific location will be limited, because another congestion will be occurred at adjacent bottlenecks. Therefore, this project is aiming to tackle the congestion problems with areal and comprehensive measures. and also this project will develop a necessary system for the responsible organization to monitor the traffic flows changing time to time so that the organization will be able to prepare appropriate countermeasures timely.</p>				
<b>9) Project Outline</b>				
<ul style="list-style-type: none"> <li>- installation and upgrading traffic signal control system</li> <li>- improvement of intersection geometrics, installation of Road signs and pavement marking</li> <li>- installation of Traffic monitoring system</li> <li>- provision of pedestrian bridges</li> <li>- development of bus interchanges and improvement of bus stops, etc.</li> </ul>				
<b>10) Expected Project Effect</b>				
the project will contribute to mitigate traffic congestions and provide to smooth and safe traffic flows, reducing economic losses and environment deterioration in the congested urban areas.				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
one of the important social issues in national level				
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Project Cost</b>	
<p>a) Feasibility Study: July. 2014 to May 2015</p> <p>b) Basic Design, Detail Design, Tender Document Preparation June.2015 to Nov. 2015</p> <p>c) Tendering: Dec. 2015</p> <p>d) Construction, Procurement, Installation: Jan. 2016 to Dec. 2016</p> <p>e) Completion of the Project: Dec. 2016</p>			<p>a) installation and upgrading traffic signal control system and improvement of intersection geometrics, installation of Road signs and pavement marking: 34 locations x USD 0.05 mil/location = USD 1.7 mil.</p> <p>b) installation of Traffic monitoring system: 21 locations x USD 0.05 mil/location = USD 1.05 mil.</p> <p>c) provision of pedestrian bridges and safety facilities 6 locations x USD 0.5 mil/location = USD 3.0 mil.</p> <p>d) development of bus interchanges and improvement of bus stops: 2 locations x USD 2.0 mil/location = USD 4.0 mil</p> <p>e) improvement of drainage system: 6 locations X USD 0.5 mil/location = USD 3.0 mil</p> <p>g) other construction cost USD 2.25 mil</p> <p>h) Engineering cost: USD 2.0 mil</p> <p>i) total project cost: USD 17.0 mil</p>	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
All Yangon Citizen			no advance impact	
<b>17) Project Area</b>		<b>18) Location Map/Site Photo</b>		
Yangon Region		<p>&lt; Current Situation &gt;</p>  <p>Source: YUTRA Project Team</p> <p>&lt; Image of bus interchange &gt;</p>  <p>Source: YUTRA Project Team</p> <p>&lt; Image of Signal Control ( by Detector) &gt;</p>  <p>Source: YUTRA Project Team</p>		

**PROJECT SUMMARY SHEET**


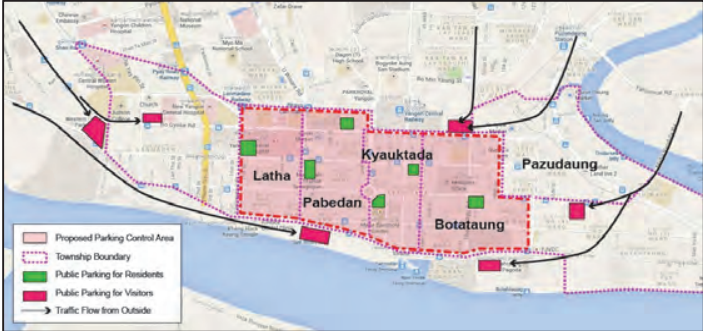

No.	1) Sector	2) Project Title		3) Project Type
TMS-03	Traffic Management and Safety	<b>Capacity Development on Traffic Planning and Management</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
YCDC		36 months	App. JPY 300 mil.	Urgent
<b>8) Background/Current Issues</b>				
<p>Traffic management policy is one of the significant urban transport policies to enhance the efficiency of road network system and to control traffic demand, nowadays role of the traffic management is increased to meet the requirement from global climate changes as well as economic losses induced by the traditional automobile oriented development. Then to build public oriented urban development become a common target in major cities in the world. Traffic demand management is indispensable component to build public transport oriented society. However, there is no specialized organization responsible for the traffic management in Yangon. This project is aiming to establish 'Traffic Planning and Management Unit' under Engineering Department YCDC and enhance their knowledge and implementation capabilities. This human resource development project shall be implemented in corroboration with the proposed traffic mitigation projects (TSM-1 and -2) so that the proposed organization will have practical experiment mutually facilitating each other.</p>				
<b>9) Project Outline</b>				
<ul style="list-style-type: none"> <li>- training on traffic engineering and management</li> <li>- implementation of pilot projects</li> <li>- development of rules and regulation related to the traffic demand management</li> <li>- training in Japan and third countries</li> <li>- seminar and workshop</li> </ul>				
<b>10) Expected Project Effect</b>				
through the human resource development project, YCDC will improve capability to implement appropriate traffic management measures for the environmentally friendly urban transport system.				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
From Engineering Department, YCDC			TMS-1, -2, -4, -5, -6	
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Project Cost</b>	
Project period August 2014 to July 2017			Total project cost JPY 300 mil	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
YCDC and in directory all Yangon Citizen through implementation of the effective traffic management measures			none	
<b>17) Project Area</b>		<b>18) Location Map/Site Photo</b>		
		<p align="center">&lt; Training Through Pilot Project &gt;</p>  <p align="center">Source: YUTRA Project Team</p> <p align="center">&lt; Lecture for Counter Part &gt;</p>  <p align="center">Source: YUTRA Project Team</p> <p align="center">&lt; Photo of Workshop &gt;</p>  <p align="center">Source: YUTRA Project Team</p>		

**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
TMS-04	Traffic Management and Safety	<b>Yangon Parking Development Project (Master Plan)</b>		
4) Implementing Agency		5) Implementing Period	6) Preliminary Construction Cost	7) Term
Yangon Region/YCDC		8 months	App. USD 1.50 mil.	Urgent/Short/Middle/Long
<b>8) Background/Current Issues</b>				
<p>Traffic congestion mitigation projects (TMS-1 and -2) will include countermeasures to reduce on-street parking problems causing traffic congestions. The countermeasures will be mainly removal or relocation of existing on-street parking lots, will be not radical solution. There are numerous issues on the parking, such as development of public parking separated from roadway, how is the regulation for garage, how to charge parking fees, who will responsible for maintenance of the parking and so forth. Moreover, what kind of parking policies will be required to meet comprehensive urban transport policies as well as urban development polices including TOD. This Parking Master Plan will make clear those issues.</p>				
<b>9) Project Outline</b>				
<ul style="list-style-type: none"> <li>- Survey on parking situation and estimation of parking demand</li> <li>- establishment of laws and regulations as well as technical guidelines</li> <li>- Public parking development plans</li> <li>- examination of public parking operation, enforcement for illegal parking</li> <li>- financial and economic evaluation, and funding</li> </ul>				
<b>10) Expected Project Effect</b>				
<p>Comprehensive parking development plan will contribute to implement necessary parking project effectively, subsequently improve traffic flows and environment in the CBD and other commercial/business areas.</p>				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Project Cost</b>	
<p>Project period August 2014 to March 2015</p>			<p>Total project cost JPY 150 mil</p>	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
<p>All Yangon Citizen</p>				
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
<p>Yangon Region</p>	<p>&lt; Location Map &gt; Source: YUTRA Project Team</p>  <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>&lt;&lt; Current Situation &gt;</p> </div> <div style="text-align: center;">  <p>&lt; Image of enforcement &gt; →</p> </div> </div> <p style="text-align: center;">Source: YUTRA Project Team <span style="float: right;">Source: Metropolitan Police Department</span></p>			

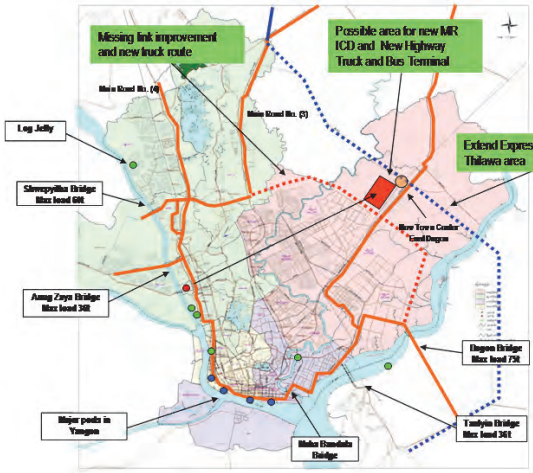


**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
TMS-05	Traffic Management and	Yangon Parking Development Project (Construction)		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Construction Cost</b>	<b>7) Term</b>
YCDC		65 months	App. USD 130 mil.	Short/Middle
<b>8) Background/Current Issues</b>				
<p>This project aims to construct public parking proposed in the Master Plan. The proposed P&amp;R parking facilities which will be established at major transit terminals will be planned and constructed in the respective public transit project. Then this project will focus on the public parking located in the CBD area. Due to the limited land availability in the CBD, the location of the parking shall be carefully selected including examination of the availability of underground spaces. In the first stage of the project, feasibility study will be carried out prior to the construction of the public parking facilities.</p>				
<b>9) Project Outline</b>				
<ul style="list-style-type: none"> <li>- to carry out Feasibility Study for the proposed public parking including environmental assessment</li> <li>- to prepare detail design and tender document</li> <li>- to supervise the construction</li> </ul>				
<b>10) Expected Project Effect</b>				
<p>On-street parking can be removed and traffic congestions will be mitigated. Moreover the spaces can be used for urban environmental improvement or pedestrian space.</p>				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
<p>On-street parking is a main cause of the congestion in CBD, thus needs of the off-street parking is high.</p>				
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Project Cost</b>	
<p>a) Feasibility Study: Apr. 2015 to Sep. 2016                  b) Basic Design, Detail Design, Tender Document Preparation                      Oct. 2016 to Sep. 2017                  c) Tendering: Oct. 2018                  d) Construction, Procurement, Installation:                      Nov. 2018 to Dec. 2020                  e) Completion of the Project: Dec. 2020</p>			<p>a) Feasibility Study: USD 2.0 mil                  b) Detail Design and tender document: USD 3.0 mil                  c) Construction:                      Under ground 50,000m<sup>2</sup> x 0.002 mil/m<sup>2</sup> = USD 100 mil                      on the ground 50,000m<sup>2</sup> x 0.0005 mil/m<sup>2</sup> = USD 25 mil                  d) Total Project Cost USD 130 mil</p>	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>&lt; Location Map &gt; Source: YUTRA Project Team</p>  <p>Source: YUTRA Project Team</p> </div> <div style="width: 50%;">  <p>&lt;&lt; Current Situation &gt;&gt;</p> <p>&lt; Image of Public Parking &gt; →</p>  <p>Source: giz Transport Policy Advisory Services</p> </div> </div>			



**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title		3) Project Type
FT-01	Rail / Truck (Freight)	<b>Inland Container Depot and Highway Truck Terminal Development</b>		
<b>4) Implementing Agency</b>		<b>5) Implementing Period</b>	<b>6) Preliminary Project Cost</b>	<b>7) Term</b>
Myanma Railways, Ministry of Rail Transportation, Yangon Region		2018 to 2022	Approximately US\$150M	medium term
<b>8) Background/Current Issues</b>				
<ul style="list-style-type: none"> <li>- Part of the Thilawa ports will be developed shortly (Japanese ODA) (opportunity).</li> <li>- International container throughput at the Thilawa ports will sharply increase.</li> <li>- The Expressway can be extended to reach the proposed ICD/Truck Terminal area (opportunity)</li> <li>- The Yangon - Mandalay Railway will be improved by 2023(opportunity).</li> <li>- MR is expected to play a vital role in transporting container cargo.</li> <li>- Land is available in East Dagon Township, owned by MR.</li> <li>- The space of existing highway truck terminal is limited and crowded.</li> <li>- The roads to the highway truck terminal are congested (traffic environment in the neighboring areas is worsening)..</li> </ul>				
<b>9) Project Outline</b>				
<ul style="list-style-type: none"> <li>- ICD and Highway Truck Terminal development (150ha)</li> <li>- Installation of cargo handling facilities</li> <li>- (MR workshop and Depot can be included)</li> </ul>				
<b>10) Expected Project Effect</b>				
<ul style="list-style-type: none"> <li>- To increase opportunity of international cargo transportation related business.</li> <li>- To improve MR business performance</li> <li>- To remove goods traffic from the highly urbanized area</li> <li>- To achieve better transport environment in the urbanized area (residential areas).</li> <li>- To contribute the national economy.</li> </ul>				
<b>11) Needs/Request from Myanmar side</b>			<b>12) Relation with Other Projects</b>	
<p>MORT to request JICA to support the feasibility study.                      MR and Highway Truck Association are coordinated.                      PW, MOC to consider the extension of the expressway                      PW, MOC to improve missing links</p>			<p>Expressway extension (from the 0 mile point to Thilawa).                      Missing link improvement                      Yangon - Mandalay Railway Improvement (financially supported by JICA)                      Thilawa Port Development (financially supported by JICA)</p>	
<b>13) Implementing Schedule</b>			<b>14) Rough Breakdown of Preliminary Project Cost</b>	
<ul style="list-style-type: none"> <li>- Feasibility study (2015/2016)</li> <li>- Budgeting / Loan application (2016/2017)</li> <li>- Procurement of consultants and detailed design (2018)</li> <li>- Tender and selection of contractors (2019)</li> <li>- Construction (2020-2021)</li> <li>- Commencement of the service (2022)</li> </ul>			<p>Civil work, pavement, buildings, lighting, access roads, etc: USD 120 million                      Cargo handling facilities, etc: USD 30 million                      TOTAL USD 150 million</p>	
<b>15) Beneficiaries</b>			<b>16) Impact to Environment (Natural/Social)</b>	
<ul style="list-style-type: none"> <li>- Myanma Railways</li> <li>- Highway truck operators</li> <li>- Cargo forwarders</li> <li>- Owner of goods</li> <li>- Yangon residents</li> <li>- Increased job opportunities</li> </ul>			EIA is required	
<b>17) Project Area</b>	<b>18) Location Map/Site Photo</b>			
East Dagon Town Ship	 <p align="right">(YUTRA Project Team)</p>			



**PROJECT SUMMARY SHEET**

No.	1) Sector	2) Project Title	3) Project Type
FT-02	Truck (Freight)	<b>Redesignation of Highway Truck Routes</b>	
4) Implementing Agency		5) Implementing Period	6) Preliminary Project Cost
Yangon Region PW, MOC YCDC		2018 to 2022	Approximately US\$2M
7) Term			medium term

**8) Background/Current Issues**

- General cargo and International container cargo throughput at the Thilawa ports will sharply increase after completion of the on-going Thilawa port development.
- The Expressway can be extended to reach the proposed ICD/Truck Terminal area (opportunity)
- The Yangon - Mandalay Railway will be improved by 2023(opportunity), and MR needs services from truck operators.
- Highway truck operators are expected to meet those changes of cargo movement pattern
- The roads to the existing highway truck terminal are congested (traffic environment in the neighboring areas is worsening).
- The land along the existing highway routes running Thu Dhamar road and Thanthumar road will be further developed for business, commercial and residential purpose.
- Accordingly the existing highway truck route of this section needs to be removed.

**9) Project Outline**

- Missing link improvement by PW, MOC / YCDC (refer to RD-18, 19, and 21) - these are not included in FT-02.
- Redesignation of highway truck route by Yangon Region and MORT
- Installation of signage, monitoring system (CCTV, etc.) along the designated route.

**10) Expected Project Effect**

- Easy access for highway trucks to reach new highway truck terminal in East Dagon Township
- To remove goods traffic from the highly urbanized area
- To achieve better transport environment in the urbanized area (residential areas).
- To contribute the national economy.

<b>11) Needs/Request from Myanmar side</b> MORT, Yangon Regional Government and Highway Truck Association are coordinated. PW, MOC and YCDC to improve missing links	<b>12) Relation with Other Projects</b> Expressway extension (from the 0 mile point to Thilawa). Missing link improvement Yangon - Mandalay Railway Improvement (financially supported by JICA) Thilawa Port Development (financially supported by JICA)
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<b>13) Implementing Schedule</b> - S series of missing link improvement and widening (RD-18, 19, and 21) - Installation of truck traffic management equipment (2020)	<b>14) Rough Breakdown of Preliminary Project Cost</b> Traffic signage, highway truck monitoring equipment, etc. TOTAL USD 2 million
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<b>15) Beneficiaries</b> - Highway truck operators - Cargo forwarders - Owner of goods - Yangon residents - Increased job opportunities	<b>16) Impact to Environment (Natural/Social)</b> EIA is required for RD-18, 19 and 21.
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