<table>
<thead>
<tr>
<th>Classification</th>
<th>Description</th>
<th>Pavement Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>Access controlled motorway</td>
<td>Asphalt or cement concrete</td>
</tr>
<tr>
<td>Class I</td>
<td>4 or more lanes highway</td>
<td>Asphalt or cement concrete</td>
</tr>
<tr>
<td>Class II</td>
<td>2 lanes</td>
<td>Asphalt or cement concrete</td>
</tr>
<tr>
<td>Class III</td>
<td>2 lanes (narrow)</td>
<td>Double bituminous treatment</td>
</tr>
</tbody>
</table>
Ministerial Understanding on the Development of the ASEAN Highways Network Project
(Signed at Hanoi, Sept. 1999)

**Adopted**
- ASEAN Highways Network
- Road Design Standard
- Development Strategy

<table>
<thead>
<tr>
<th>Phase</th>
<th>Year</th>
<th>Technical Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>2000</td>
<td>Completed network and ASEAN routes</td>
</tr>
<tr>
<td>Stage 2</td>
<td>2004</td>
<td>- Road Sign installed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- All ASEAN routes $\rightarrow$ at least Class III</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Missing link $\rightarrow$ construction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Operational designated cross border point</td>
</tr>
<tr>
<td>Stage 3</td>
<td>2020</td>
<td>- ASEAN routes be Class I/Primary Class II for non-arterial routes</td>
</tr>
</tbody>
</table>
Compaction of Embankment

Compaction of Subgrade
Compacted Subgrade

Subbase Course
Seal Coating Application

Base Course Compaction
Bituminous Road

Placing Asphalt Concrete
Tie bars and Dowel bars

Placing Plain Concrete by Slip form paver
Cutting Joints

Sealed Joint
Achievements in Road Sector

Nyaung Oo – Myingyan Road

Pathein – Monywa Highway

Pyimanar - Yamethin Road

Meiktila – Taunggyi Road
Major Projects coming
Yangon- Mandalay New Express Way

Concrete Road

Started on 10.10.2005

• Opened to public
  • On (25.3.2009) for Yangon – Nay Pyi Taw portion
  • On (29.12.2010) for Nay Pyi Taw – Sakainn portion
  • On (23.12.2011) for Sakainn – Tadaoo – Tagonedine

366 mile 3 furlong long and 100ft (8 lanes x 12.5 ft) wide

• Would like to upgrade to Asphalt Concrete for improving service year.
Yangon-Mandalay Expressway (Rigid pavement) Project Data

<table>
<thead>
<tr>
<th>S.N</th>
<th>Particular</th>
<th>Construction Period</th>
<th>Length (km)</th>
<th>Opened to Public</th>
</tr>
</thead>
</table>

Total Length: 586.2 km

-Total Project Cost: 1291.345 billion in kyats

- To improve Asphalt wearing course
- To install road safety furniture such as guardrails and barriers
- To set up the Intelligent Transport System
Yangon-Mandalay Expressway (586.2km)
Greater Mekong Subregion Economic Cooperation (GMS)

**Goal:** To promote socio-econ. development by strengthening economic linkages

**9 Sectors:**

1. Transport
2. Energy
3. Agriculture
4. Environment
5. HRD
6. Urban Development
7. Tourism
8. Transport & Trade Facilitation
9. ICT

Source: Training Program on Road and Bridge Engineering at Department of Highways, Thailand
Future GMS Corridors

Source: Training Program on Road and Bridge Engineering at Department of Highways, Thailand
**Myanmar-Laos-Vietnam Trilateral East-West Corridor**

(from Kyaukphyu sea port to Hai Phong sea port)

**Myanmar km mile**
- Kyaukphyu to Kyainglat Border 1340 837.5

**Laos**
- Border bridge to Tai Chan (Vietnam) 372 232.5

**Vietnam**
- Border to Hai Phong 561 350.6

Total length (estimated) 2273 1420.6
Connectivity with China

Ruili, China to Kyaukphyu, Myanmar Corridor

A, Ruili to Hsipaw  240 km
B, Namkhan to Hsipaw  182 km
K, Hsipaw to YM ExWay  192 km
E, YM ExWay to Padan  265 km
D, PyinOoLwin to Padan  377 km
K1, Padan to Kyauksauk  155 km
K1, Padan to YM ExWay  148 km

Proposed by Myanmar side
B+K+E+K1  794 km

Proposed by China side
A +K+ExWay+K1  900 km
(ExWay- 165 km)
Thailand - Myanmar - India
Transport Linkages
Ministerial Meeting
23 December 2003
New Delhi

Source: Training Program on Road and Bridge Engineering at Department of Highways, Thailand
In Tanintharyi Region, road link between Dawei SEZ and Phunamron, the border village of Thailand (132 km) will be implemented under the guidance of Government of Myanmar and Thailand.
Brief History of B.O.T Road

- Partnering Bodies: Public Works of Ministry of Construction and Local Private Companies
- Established in: 1996
- First BOT Road: Mandalay-Lashio-Nankham Road
- First Partnering Local Companies: (1) Asia World Company (2) Diamond Palace Company
Achievements and Recent Experiences

- Quantity of local companies - 28 nos. conducting BOT Road
- Number of BOT Road - 60 nos.
- BOT Road Length - 5511.2 kilometers (3444/5 miles)
- Road Length % of PW's - 14 % of Public Works Total Road
- States and Regions with BOT Road - 12 states and regions out of 14 except Kayah and Chin states due to low traffic volume
Contract Period
- 60 years (from the start of Operating Period until the end of Transfer Period)

Upgrading of Road and related facilities
- Road to be upgraded until bituminous road with stipulated standards within 3 years Construction Period depending on the traffic volume
- Bridges along the road to be upgraded until R.C bridges of 75 ton loading bearing capacity
BOT Regulations for International Companies

- Start BOT Toll Rate - After the Contractor received Final Completion Certificate from the Client, the Contractor can collect toll according to specified B.O.T. rate.

- Performance Guarantee - the Company has to pay 1% of the investment and which will be returned back on attaining the Completion Certificate.
Tax on the toll collected payable to the State by BOT Companies

- First 3 years (3 years) - Exempted
- From 4th until 18th year (15 years) - 10% of total toll collected
- From 19th until 33rd year (15 years) - 15% of total toll collected
- From 34th until 48th year (15 years) - 20% of total toll collected
- From 49th until 60th year (12 years) - 30% of total toll collected

Beyond 60 years period - the Company can extend contract for 5 years period each time until 3 times
Present Conditions

- Most of travel way width are still 12 ft.

- Some percent of road infrastructure are damaged.

- Lack to install the standard road furniture.
  (Retaining wall, Drainage, Road sign & etc.)

- Currently, emphasize on pavement and bridge due to limited budget.
Required Technology

- Development of Cement Foamed-Asphalt Stabilization Technology.
- Slope Protection Technology.
- Pavement Preservation & Re-Construction.
- Micro surfacing technique.
- Cement stabilization of Roads.
## Myanmar’s Strengths, Constraints, Opportunities And Risks

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Strong commitment to reform</td>
<td>1. Weak macroeconomic management and lack of experience with market mechanisms</td>
</tr>
<tr>
<td>2. Large youthful population, providing a low-cost labor force attractive to foreign investment</td>
<td>2. Limited fiscal resource mobilization</td>
</tr>
<tr>
<td>4. Abundant agricultural resources to be exploited for productivity improvement</td>
<td>4. Inadequate infrastructure, particularly in transport, electricity access and Telecommunications</td>
</tr>
<tr>
<td>5. Tourism potential</td>
<td>5. Low education and health achievement</td>
</tr>
<tr>
<td></td>
<td>6. Limited economic diversification</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Strategic location</td>
<td>1. Risks from economic reform and liberalization</td>
</tr>
<tr>
<td>2. Potential of renewable energy</td>
<td>2. Risks from climate change</td>
</tr>
<tr>
<td>3. Potential for investment in a range of sectors</td>
<td>3. Pollution from economic activities</td>
</tr>
<tr>
<td></td>
<td>4. Tension from internal ethnic conflicts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Financial Institutions/Organizations</th>
<th>Proposed Project</th>
<th>Area</th>
<th>Duration</th>
<th>Proposed Amount (in million US$)</th>
<th>Loan/Grant/TA</th>
<th>Minstry/Department</th>
<th>Priorities List</th>
<th>Aims</th>
<th>Expected Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Japan</td>
<td>Bridge Maintenance and Management System</td>
<td>Naypyitaw</td>
<td>2014-2015</td>
<td>15.00 Grant</td>
<td></td>
<td>Public Works, Minstry of Construction</td>
<td>High</td>
<td>to maintain major bridges over 20 years life and make the systematic preventive maintenance of bridges</td>
<td>Improvement in management and maintenance technology</td>
</tr>
<tr>
<td>2</td>
<td>Japan</td>
<td>Ayeyarwaddy Bridge (Hinthada)</td>
<td>Ayeyarwaddy</td>
<td>2016-2017</td>
<td>230.00 Grant</td>
<td></td>
<td>Public Works, Minstry of Construction</td>
<td>High</td>
<td>to connect the road network in Yangon, Bagon and Ayeyarwaddy region</td>
<td>Development for all round sectors in Yangon, Bago and Ayeyarwaddy region</td>
</tr>
<tr>
<td>3</td>
<td>Japan</td>
<td>Yangon-Thilawa Bridge</td>
<td>Yangon</td>
<td>2016-2012</td>
<td>110.00 ODA Loan</td>
<td></td>
<td>Public Works, Minstry of Construction</td>
<td>High</td>
<td>to get smooth transportation between Yangon and Thilawa SEZ</td>
<td>Rapid development in Yangon region</td>
</tr>
<tr>
<td>4</td>
<td>Japan</td>
<td>Technical Corporation Plan(scholarship/program) Road and Bridge Design Construction Training Program both local and Abroad</td>
<td>Naypyitaw, Yangon</td>
<td>2014-2016</td>
<td>10.00 Grant</td>
<td></td>
<td>Public Works, Minstry of Construction</td>
<td>High</td>
<td>to broaden the knowledge and improve high tech design skills</td>
<td>To upgrade the capacity building of road and bridge engineers</td>
</tr>
<tr>
<td>5</td>
<td>Japan</td>
<td>Upgrading Thuwunna Training Center</td>
<td>Yangon</td>
<td>2014-2016</td>
<td>4.50 Grant</td>
<td></td>
<td>Public Works, Minstry of Construction</td>
<td>High</td>
<td>to establish the modernized training center</td>
<td>To utilize modernized facilities and techniques</td>
</tr>
<tr>
<td>6</td>
<td>Japan</td>
<td>Road Maintenance and Management System</td>
<td>Naypyitaw</td>
<td>2014-2016</td>
<td>30.00 Grant</td>
<td></td>
<td>Public Works, Minstry of Construction</td>
<td>High</td>
<td>to develop road maintenance, management and database system</td>
<td>To maintain the existing road standard</td>
</tr>
<tr>
<td>7</td>
<td>Japan</td>
<td>Road, Bridge and Tunnelling Research Centre</td>
<td>Naypyitaw</td>
<td>2014-2016</td>
<td>30.00 Grant</td>
<td></td>
<td>Public Works, Minstry of Construction</td>
<td>High</td>
<td>to establish the modernized research centre</td>
<td>Impovement of research in related fields</td>
</tr>
<tr>
<td>8</td>
<td>Japan</td>
<td>Thakata Bridge (New)</td>
<td>Yagon</td>
<td>2014-2016</td>
<td>10.00 Grant</td>
<td></td>
<td>Public Works, Minstry of Construction</td>
<td>High</td>
<td>to facilitate the smooth transportation in Yangon</td>
<td>Reduction in traffic congestion</td>
</tr>
</tbody>
</table>
## T/A, Grant & Loan Collaboration with Japan

<table>
<thead>
<tr>
<th>No</th>
<th>Particular</th>
<th>Amount (million)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>US($)</td>
<td>Japan(¥)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>T/A for Road</td>
<td>14.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Grant for Road</td>
<td>1559.00</td>
<td>136.50</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Grant for Bridge</td>
<td>25.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Loan for Road</td>
<td></td>
<td>9480.34</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Loan for Bridge</td>
<td>659.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2257.74</td>
<td>9616.84</td>
<td></td>
</tr>
</tbody>
</table>

Source: Public Works, Ministry of Construction
Successful Joint Venture Works Between Myanmar & Japan

1) Chiyoda – Public Works (CPW)
2) J & M SS (JFE & Myanmar Steel Solution)

Future Joint Venture Works Between Myanmar & Japan

1) IHI Co., Ltd (Japan) & Public Works (Myanmar)
CONCLUSION
To upgrade and rehabilitate insufficient infrastructure capacity for the economic development.

To have Financial & Technical assistance from friendship countries for infrastructure development.

To promote skilled, capacity building for human resources and research institution of infrastructure development.
Conclusion

- Public Works is trying to construct the road network to reach every township across Myanmar and contributes in promoting poverty reduction, development and communication.

- Public Works is implementing and rehabilitation of new and existing roads and bridges across the country to travel smoothly in all weather conditions which in turn promotes health, education, socio-economic and transportation sector of urban, rural and border areas within the limitation of budgets.

- Public works welcome Local and Foreign developers who would like to invest in road and bridge sectors according to current BOT schemes or PPP System.
Thank you for your attention