LOW VOLUME SEALED ROADS

THE MALAWI EXPRERIENCE

Presented by: Eng Placid C Kasakatira (DoPD)

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PRESENTATION OUTLINE

- Background of Malawi road network
- Why paved roads under rural accessibility
- LVSR in Malawi – the Malawi Experience
- Technical performance of existing LVSR
- Challenges
- Key Lessons to date
- Way forward
- Conclusion
- Pictures of LVSR

BACKGROUND

- Malawi public road network – 15,451km
- Unpaved - 75%
- Additional but not classified (unpaved) – 9,500km
- Some major characteristics of unpaved roads
  - Seasonal accessibility
  - Longer travel times
  - High VOC
  - High maintenance cost
  - A waste zone for non-renewable gravel
  - Environmentally, unfriendly

WHY TALK OF PAVED ROADS FOR RURAL ACCESSIBILITY?

- Cheaper in terms of both
  - Recurrent maintenance cost
  - Whole life cycle cost
- They stimulate social economic growth

BUT initial capital investment cost very high due to

- Being stuck with Conventional Approaches regardless of other important factors

Are there no alternative ways of having paved roads at lower costs?

LOW VOLUME SEALED ROADS APPROACH

LOW VOLUME SEALED ROADS (LVSR) IN MALAWI

- LVSR dating as back as 20 years and beyond exist
  - No proper records in place
  - Discovered through rehabilitation works
- Recent LVSR – a total of about 20km
  - Taken advantage of existing situation on the ground
    - Old ages of existing earth roads (>40 years) – CONSOLIDATED PAVEMENTS
    - Reasonably engineered alignments

LOW VOLUME SEALED ROADS (LVSR) IN MALAWI – Cont..

Recent LVSR – Cont..

- Simplistic approach adopted
  - Use of simplified bidding documentation
  - Adoption of a two-layer construction system
    - Usage of the existing pavement as sub-base
    - Place gravel and compact to 98% MDD as base followed by appropriate surfacing

LOW VOLUME SEALED ROADS (LVSR) IN MALAWI – Cont..

- Cost efficiency achieved – US$90,000/km through
  - Use of medium scale local contractors
  - Utilization of global and fewer work items
  - Simplistic design approach
- Currently such projects could be done at about US$150,000/km against about US$500,000/km

TECHNICAL PERFORMANCE OF EXISTING LVSR

- Not much evaluation done so far
- All roads performing nicely – all in good condition after 5 to 9 years of use
- Some of the roads carrying ADT of >6000

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TECHNICAL PERFORMANCE OF EXISTING LVSR – Cont..

- Pavement layers strength conducted through DCP tests
  - Original earth roads derived CBR – 53 to 78%
  - Base CBR – 90 to 145% (from original 60 to 70% soon after construction)
  - The roads should have failed long time ago theoretically
  - No conclusions made yet

Could the AFCAP Initiatives provide the FINAL ANSWER?

ROADS AUTHORITY MALAWI

THE CHALLENGES

- Acceptance by the General Public
  - Always looking forward to conventional standards
- Lack of acceptance by the Construction Industry
  - Believe this is a high risk undertaking
- Lack of funding commitment for rolling-out the initiative
  - Not fully embraced by Government and Cooperating Partners

KEY LESSONS TO DATE

- LVSR approach can comfortably be applied even to medium volume traffic roads
- Performance Evaluation and Record Keeping very crucial

Way Forward

- Need for extensive assessment of the performance success story of LVSR
- Develop more robust standard document for LVSR in terms of
  - Design approach
  - Bidding documentation

Malawi AFCAP Project on "Performance Review of Design Standards, Technical Specifications and Bidding Documents for LVSR in Malawi" – a move in the right direction

CONCLUSION

- LVSR is surely one possible cost-effective and friendly solution to Africa's rural accessibility
  - Time for practitioners to promote and support the LVSR philosophy is NOW
  - Need for practitioners to come up with Stakeholders acceptance and buy-in initiatives for LVSR

LVSR PICTURES

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Ntchisi LVSR after 7 years being in use – No damage despite inadequate drainage

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NS Conventional (2 yrs old) and LVSR (7 yrs old) Road Sections connection

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NS LVSR (7 yrs old) and Conventional (2 yrs old) Road Sections Connection

ROADS AUTHORITY MALAWI

NS Earth (>20 yrs old) and LVSR (7 yrs old) Road Sections connection – Note the Same Crown and Cross Section Features

Dowa LVSR after 4 years being in use – 4m wide and little maintenance

Dowa Earth (>20 yrs old) and LVSR (4 yrs old) Road Sections connection – Note the Same Crown and Cross Section Feature

Dowa LVSR (4 yrs old) – 150mm Gravel placed direct existing earth road (all the gravel on the shoulder has been lost)

Dowa existing Earth (>20 yrs old) whose other section has been LV sealed

Urban Residential Road done under LVSR approach – 9 yrs old with ADT of >3000

LL City A47 road – LVSR Characteristics but still standing over 20 years of use without rehabilitation

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Thank YOU