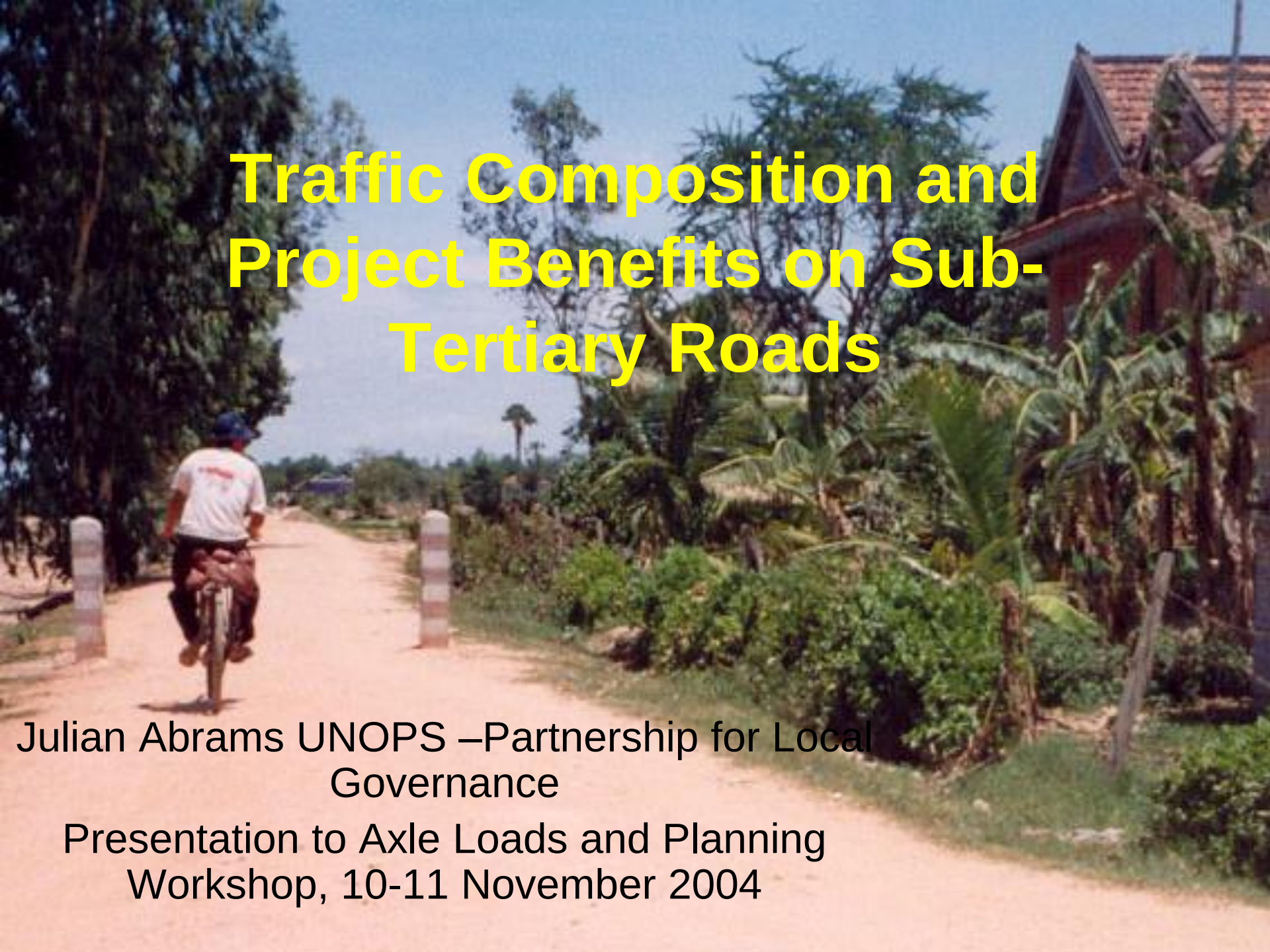

Traffic Composition and Project Benefits on Sub-Tertiary Roads

Julian Abrams UNOPS –Partnership for Local Governance

Presentation to Axle Loads and Planning Workshop, 10-11 November 2004

The Sub-Tertiary Road Network

- By length, the majority of Cambodia's road network falls within the "sub-tertiary" category
- There are about 20,000km of sub-tertiary roads
- In policy and in practice, direct management responsibility for these roads is with the Commune Councils
- Each Commune is responsible for 10-20km of road on average

Rural people's travel patterns

- Around 80% of the population of Cambodia are rural dwellers who depend at least partially on agriculture for their livelihoods.
- Most personal travel is local and is largely on sub-tertiary roads
- Transport of agricultural inputs and of crops, begins or ends on sub-tertiary roads

MRD Study of Commune Road Projects

- In 2003 Commune Councils invested over 60% of their available development funds in rural road improvements.
- MRD studied a random sample of these local road projects, beginning before project implementation and continuing until about 9 months after implementation.

Details of Sample

Province	District	Commune	Length (km)
Battambang	Banan	Snoeng	6.382
	Bavel	Kdol Tahen	3.619
	Sangkae	Kampong Preah	2.021
	Kamrieng	Boeng Reang	2.145
	Koas Krala	Thipakdei	2.732
Kampong Cham	Prey Chhor	Thma Pun	0.62
	Tbong Khmom	Thma Pechr	2.238
Takeo	Bati	Krang Leav	6.245
	Kirivong	Phnom Denh	1.7
	Samroang	Khvav	4.365

Methodology of Study

- Interviews with Commune Council
- Physical inspection of the roads
- Simple measurements of surface quality
- Traffic counts
- Origin and destination survey
- Traffic speed measurements

Findings

Volume and Composition of Traffic

Traffic type	Pre-survey		Final post-survey		
	Volume	Proportion	Volume	Proportion	Change
Bicycle	1967	49.1%	2348	46.2%	19%
Moto	1725	43.1%	2315	45.5%	34%
Remorque	35	0.9%	78	1.5%	119%
Ox Cart	154	3.8%	167	3.3%	9%
HorseCart	23	0.6%	88	1.7%	286%
Koh-Yon	33	0.8%	16	0.3%	-52%
Car	14	0.3%	33	0.6%	136%
Pickup	13	0.3%	36	0.7%	170%
Trucks	24	0.6%	7	0.1%	-73%
Other	19	0.5%	0	0.0%	-100%

Transport means as % of personal journeys

Traffic type	% of wheeled traffic	Occupancy	% of personal journeys	Adjusted to include pedestrians
Pedestrians				22%
Bicycle	46.2%	1.2	32%	26%
Moto	45.5%	1.9	51%	40%
Remorque	1.5%	5.5	5%	4%
Ox Cart	3.3%	1.9	4%	3%
HorseCart	1.7%	2.5	3%	2%
Koh-Yon	0.3%	2.5	0%	0%
Car	0.6%	3.7	1%	1%
Pickup	0.7%	5.4	2%	2%
Trucks	0.1%	7.3	1%	0%

Vehicle Ownership and Origin and Destination Data

Traffic type	% owned by commune residents	Journey type		
		Within village	Within commune	To or from outside commune
Bicycle	69%	60%	28%	12%
Moto	65%	53%	33%	14%
Remorque	96%	43%	42%	15%
Ox Cart	75%	75%	13%	12%
HorseCart	75%	88%	9%	3%
Koh-Yon	27%	52%	38%	10%
Car	42%	32%	22%	46%
Pickup	39%	54%	25%	21%
Trucks	71%	44%	36%	19%
Weighted average	**68%**	**56%**	**30%**	**14%**

Reasons For Prioritising Projects

Rank	Reason
1	People travel from their houses to the fields
2	People from the commune travel to the market to sell
3	Children go to school
4	People from outside the commune come to buy
5	People travel to work
6	Transport Crops

Distribution of Project Benefits

Type of journey	Present Value	%
Foot	$ 44,737.47	25%
Bicycle	$ 21,848.59	12%
Moto	$ 66,089.12	37%
Moto-trailer	$ 4,774.31	3%
Ox Cart	$ -	0%
Horse cart	$ 1,799.27	1%
Koh-Yon	$ 18,851.29	11%
Car	$ 3,349.23	2%
Pickup	$ 6,897.59	4%
Truck	$ 7,658.90	4%
Other	$ 2,904.19	2%
Total	**$178,909.94**	**100%**

Implications

- For most sub-tertiary roads, heavy goods traffic is not important in either volume or economic terms
- Exclusion of heavy traffic allows lower design standards to be applied, saving investment costs.
- Exclusion of heavy traffic reduces maintenance costs
- Exclusion of heavy traffic reduces dust nuisance and accident danger.

Implications

- Exclusion of heavy traffic by applying axle load restrictions is not practical on sub-tertiary roads
- The most practical solution is to install physical barriers to restrict height or width of vehicles using the roads
- Width restriction posts are a common sight on rehabilitated rural roads. However, the success rate is variable

Width restriction posts

Observations

- The decision to exclude heavy traffic from a road is an economic decision.
- For some roads, the benefits of allowing heavy traffic are greater than the costs
- Where there is a considerable existing volume of heavy traffic, imposing restrictions is not likely to be successful

Rural Road Culvert damaged by Heavy Goods Traffic

Proposals

- Vehicle size restrictions should be applied to all roads under management of Commune Councils.
- Roads for which restrictions are not economic or not practical should remain under PDRD or PWPWT management
- There is a need for a comprehensive survey and inventory, including traffic counts, to establish management responsibility for each line of road.

Proposals

- Traffic counts are most often reported as a single “ADT” value, which may be adjusted by giving different “weights” to different types of vehicle.
- This does not provide the full information needed for appropriate planning decisions on rural roads
- It is proposed that traffic counts on rural roads should report 3 broad categories of traffic:
  - Heavy goods vehicles
  - Light 4-wheeled vehicles
  - Motorcycles and non-motorised traffic

Traffic Counts Reported By Category

Project	Two-wheeled and NMT	Light 4-wheeled	Heavy goods
Snoeng	810	24	2
Kdol Tahen	261	10	0
Kampong Preah	315	29	13
Boeng Reang	229	11	2
Thipak -dei	60	0	0
Thma Pun	311	16	0
Thma Pechr	493	14	4
Krang Leav	986	11	5
Phnom Denh	2863	614	48
Khvav	633	10	0

Thank You

គំរោងគ្រួសក្រហម ឃុំពារាម ស្រុកឋានី ខេតតាកែវ