

Session 7.1: Traffic Counts, Origin-Destination Surveys and Other Approaches

1 Why do we need traffic surveys?

2 Traffic counting

3 Origin-destination surveys

4 Rural transport hubs and spokes

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3 Origin-destination surveys














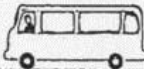






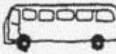










4 Rural transport hubs and spokes

1: Why do we need traffic surveys?

- Estimate past traffic for evaluation
- Estimate present traffic for design
- Estimate future traffic for design
- Estimate the composition of traffic
- Estimate traffic movements
- Estimate damage to the road

- **Traffic Volume:** Traffic volume is defined as the number of vehicles moving in a specified direction on a given lane or roadway that pass a given point or cross section during specified unit of time. It is expressed as vehicles per hour or vehicles per day
- **Traffic Demand:** Traffic demand is defined as the number of vehicles desired to pass a point on a traffic lane/ highway per unit time.

- Traffic volume studies are conducted to collect data on the number of vehicles and/or pedestrians that pass a point on a highway during a specified time period
- The data collected may also be put into classes such as direction of travel, lane distribution, turning movements, occupancy rates and vehicle type – car, truck bus etc.
- Pedestrians should be disaggregated by gender, by age (child or adult), and whether loads are carried.

CATEGORY	SUB-CAT	NAME	EXAMPLES							
2	B	Bicycle	Adult .		Child		Etc			
	M	Motorcycle	Motorcycle		Moped		Scooter			
3	R	Leg powered Rickshaw	Pushing		Pulling		Pedalled Freight Transport			
	A	Auto Rickshaw	Scooter Rickshaw		Other Powered 3-Wheeler					
4	C	Cars & Light Vans	Car		Jeep		Private Mini-Bus		All vans with only 4-tyres	
	T	Taxis & Paratransit	Taxi		Pick-up		Micro-Bus		Mini-Bus	
5+	P	Public Transport	Double Decker		Single Deck Bus or Coach with 20+seats			Passenger vehicles with more than 4-tyres		
	G	Goods Vehicles	Rigid		Articulated		Trailer		All Vehicles with more than 4 tyres	
L		Leg Powered	Hand Cart		Animal Cart					
O		Other	Tractor		Earth Mover		Tram Car		Other	

Drawn by: G. Holland T.O.R.G. University of Newcastle upon Tyne. 1993.

On rural roads and tracks it is important to include pedestrians in traffic surveys because:

- They are a major component of demand
- If access is improved they can switch to vehicles
- Road planning models such as HDM-4 and RED recognise that people walk more slowly on rough roads hence there are economic benefits to pedestrians if roads are improved.



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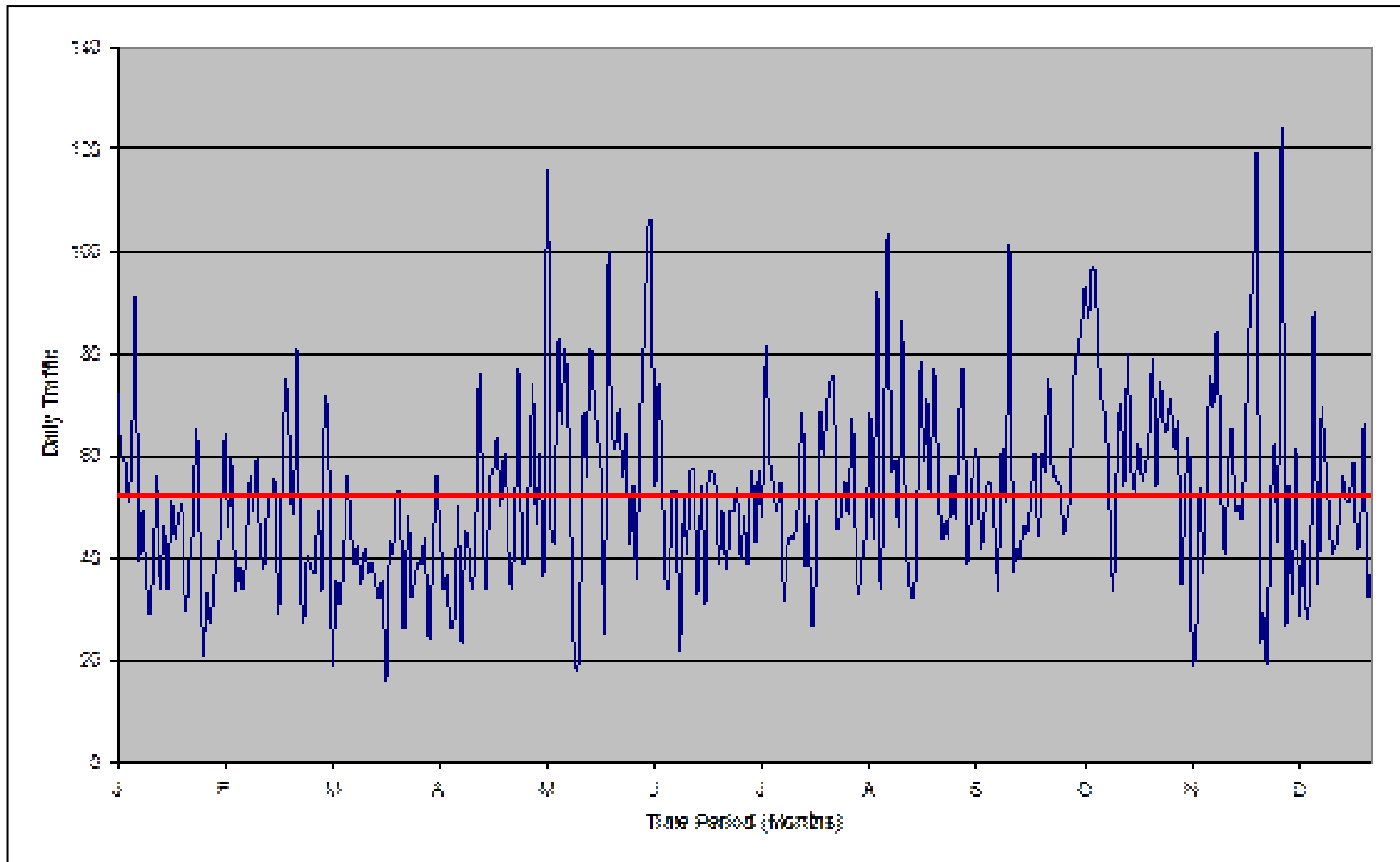
4 Rural transport hubs and spokes

- Volume characteristics that may be collected from traffic volume studies are:
 - *Average Annual Daily Traffic (AADT)*
 - *Average Daily Traffic (ADT)*
 - *Average Annual Weekday Traffic (AAWT)*
 - *Average Weekday Traffic (AWT)*
 - *Peak Hour Volume (PHV)*
 - *Peak Hour Factor (PHF)*
 - *Design Hour Volume (DHV)*

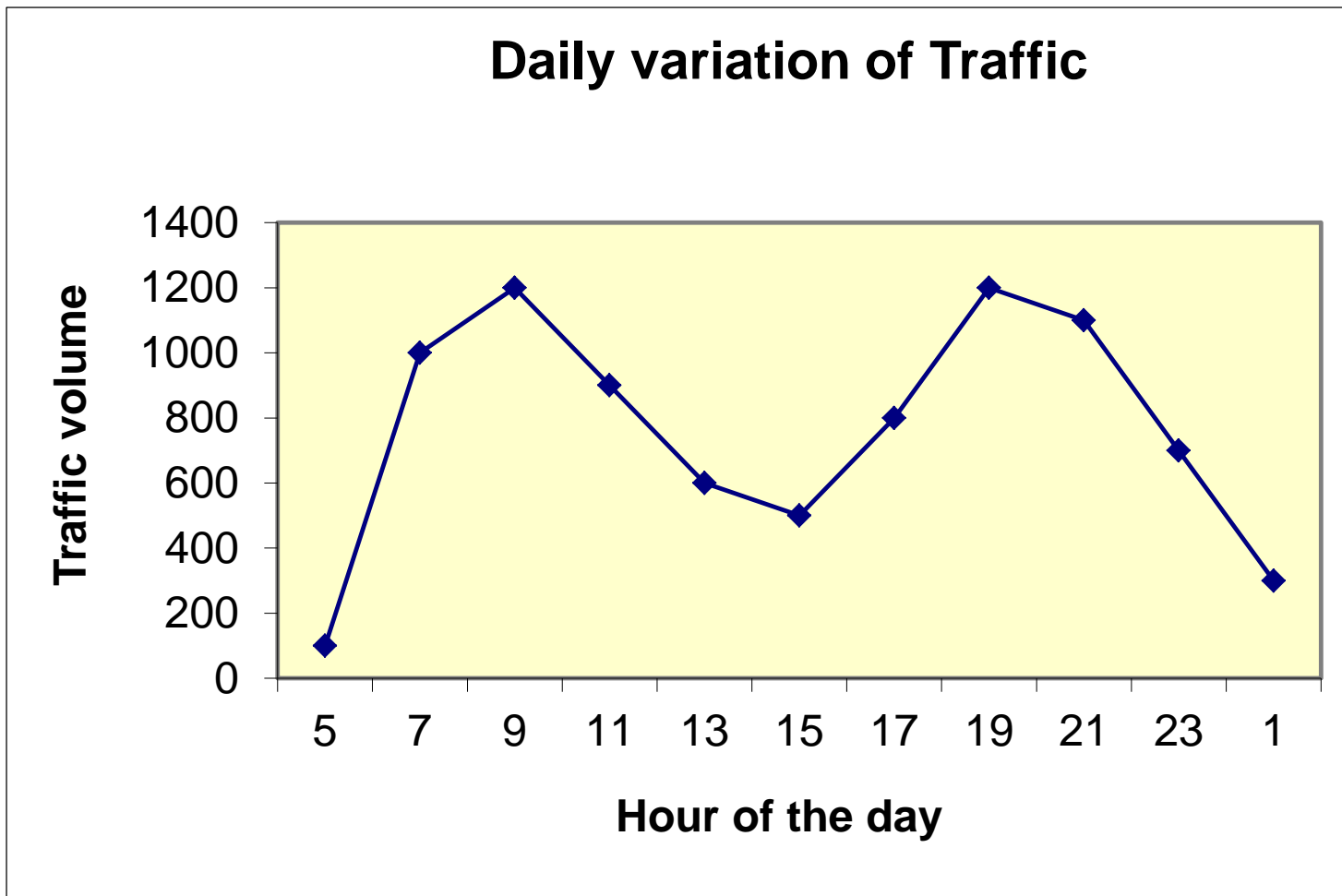
Average Annual Daily Traffic (AADT)

- AADT is the average of 24-hr counts collected every day in the year, used to:
 - Estimate road user revenues
 - Measure accident rates
 - Identify volume trends
 - Contribute to maintenance programmes

AFCAP Fluctuations in traffic flow



Daily traffic counts over a 12 month period for a low volume road in Thailand



- There are two methods of data collection:
 1. *Mechanical Counters*
 2. *Manual Method*

Mechanical Counters:

- Records total number of vehicles through a pneumatic hose placed across the roadway, or by a sensor
- This method can work day and night for a desired period to record the total hourly volume
- Accuracy of counters to capture the volume of classified traffic is poor, as well as the details of turning movements (unless using inductive loops)
- Vehicle occupancy must be undertaken manually



- Requires a field team to record traffic volume
- Obtains data such as pedestrian movements, vehicle classification, turning movements and occupancy rates
- The drawback of this method is that it is not practical to collect data for 24 hours a day on all days of the year

Planning a classified manual traffic count

- When to carry out the survey
- Location of survey
- Staffing and equipment
- Recording traffic count data

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AFCAP 3. Origin – Destination surveys

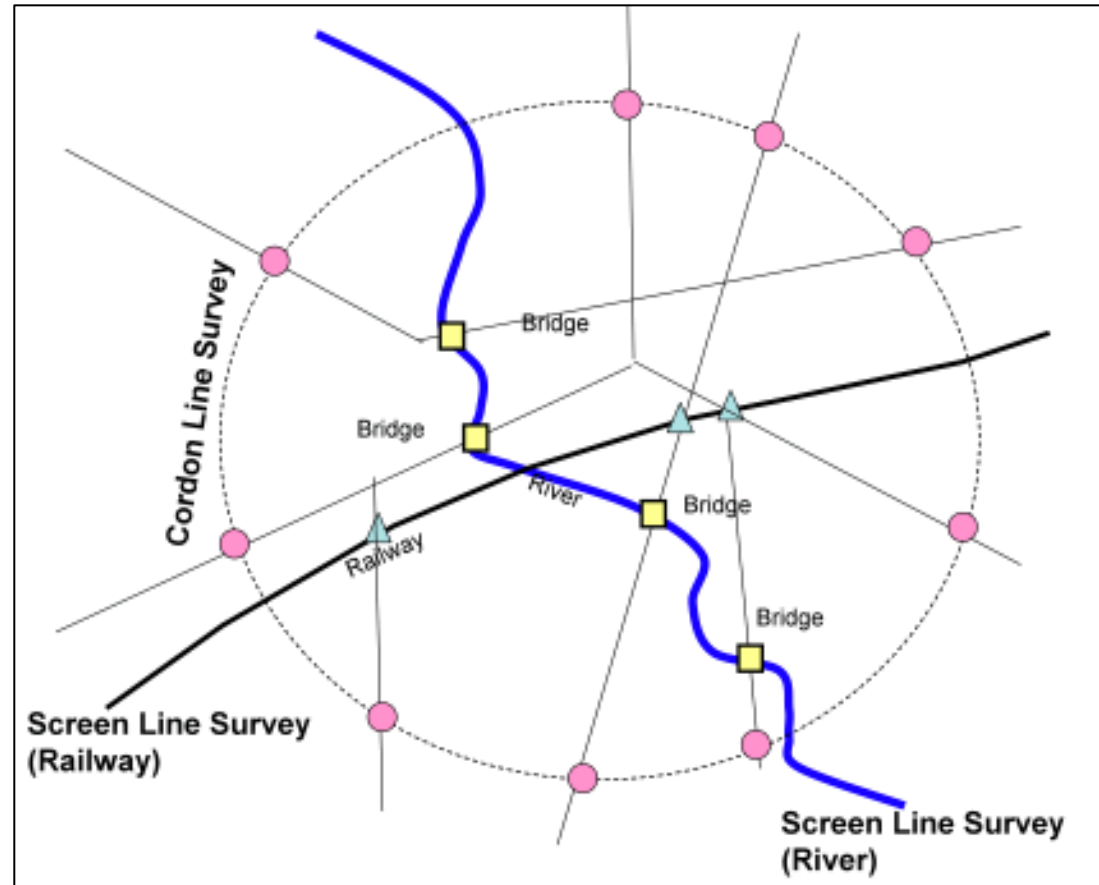
- Provide information on:
 - Route choice
 - Through traffic
 - Travel times
 - Journey purpose
- Methods
 - Home interviews
 - Registration number method
 - Roadside interviews

- Knowledge of traffic counts at various locations is not sufficient, it is necessary to know:
 - Where the vehicles are coming from
 - Where they are going
- The main aim of the O-D surveys is to establish the travel patterns in a study area
- The travel pattern is documented by preparing the O-D matrices, the cells of which give the number of trips made between pairs of traffic zones

- Before carrying out any O-D survey the study area needs defining
- Delineate the area by defining:
 - Traffic zones – to include areas with homogenous land uses and trip making characteristics
 - Cordon lines - cordon stations are established wherever the cordon line intersects the transport links feeding into the area.
 - Screen lines - screen lines are imaginary lines drawn along natural/artificial boundaries.

The travel pattern in a study area is the result of four types of movement:

1. Through movements
2. External-internal movements
3. Internal-external movement
4. Internal movements



II	II	II	II	II	II	IE	IE
II	II	II	II	II	II	IE	IE
II	II	II	II	II	II	IE	IE
II	II	T	II	II	II	IE	IE
II	II	II	II	II	II	IE	IE
II	II	II	II	II	II	IE	IE
EI	EI	EI	EI	EI	EI	EE	EE
EI	EI	EI	EI	EI	EI	EE	EE

- Requirements of Interview Site:
 - Safety of the interviewers and motorists is paramount
 - Minimum of 80-100m of unrestricted sight distance on both sides and clear of intersections
 - Prior authorisation from the police and relevant local authorities is required
- Interview Personnel:
 - Chief researcher, two recorders, six interviewers and two policemen
- Procedure:
 - The questionnaire should be designed with care and interviewers given adequate training.

ORIGIN – DESTINATION FIELD DATASHEET

Station: _____ Location: _____ Direction: _____

Weather: _____ Time of Start: _____ Time of End: _____

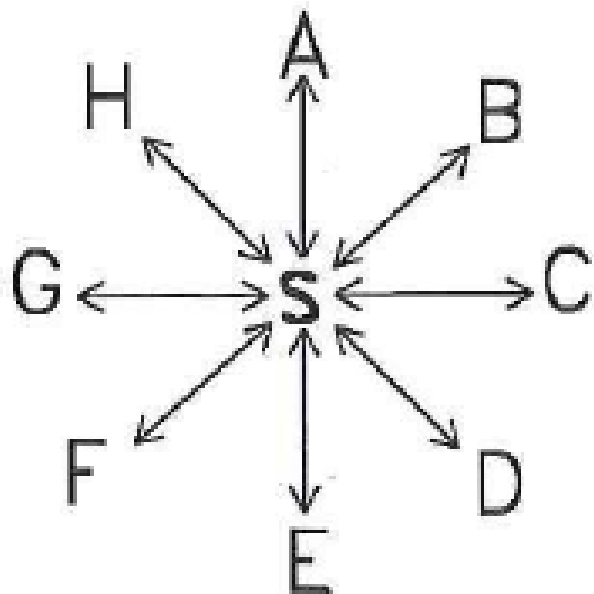
Date: _____ Name of the Enumerator _____

Time of Interview	Vehicle Type		Origin			Destination		Purpose	Occupancy (Include the Driver)	
Vehicle Type	Two Wheeler	Auto Rickshaw	Car / Jeep	Cool Cab	Taxi	BEST Bus	ST Bus	A/c Bus	Chartered Bus	Mini Bus / Van
Code	1	2	3	4	5	6		7	8	9
Purpose	Work		Education	Business – Personal		Business – Employer's		Social/Recreation		Shoppin g
Code	1		2	3		4		5		6

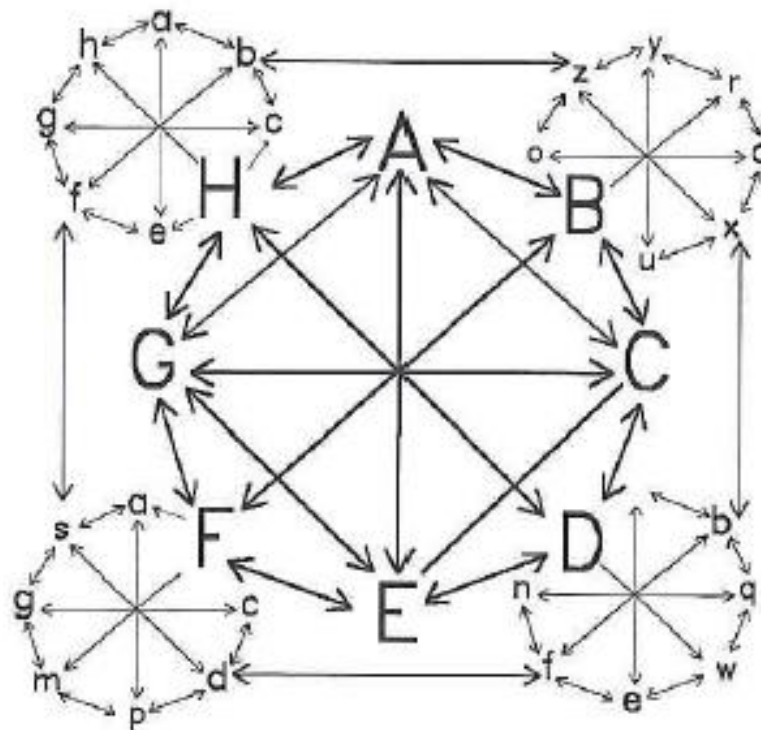


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4. Rural transport hubs and spoke model

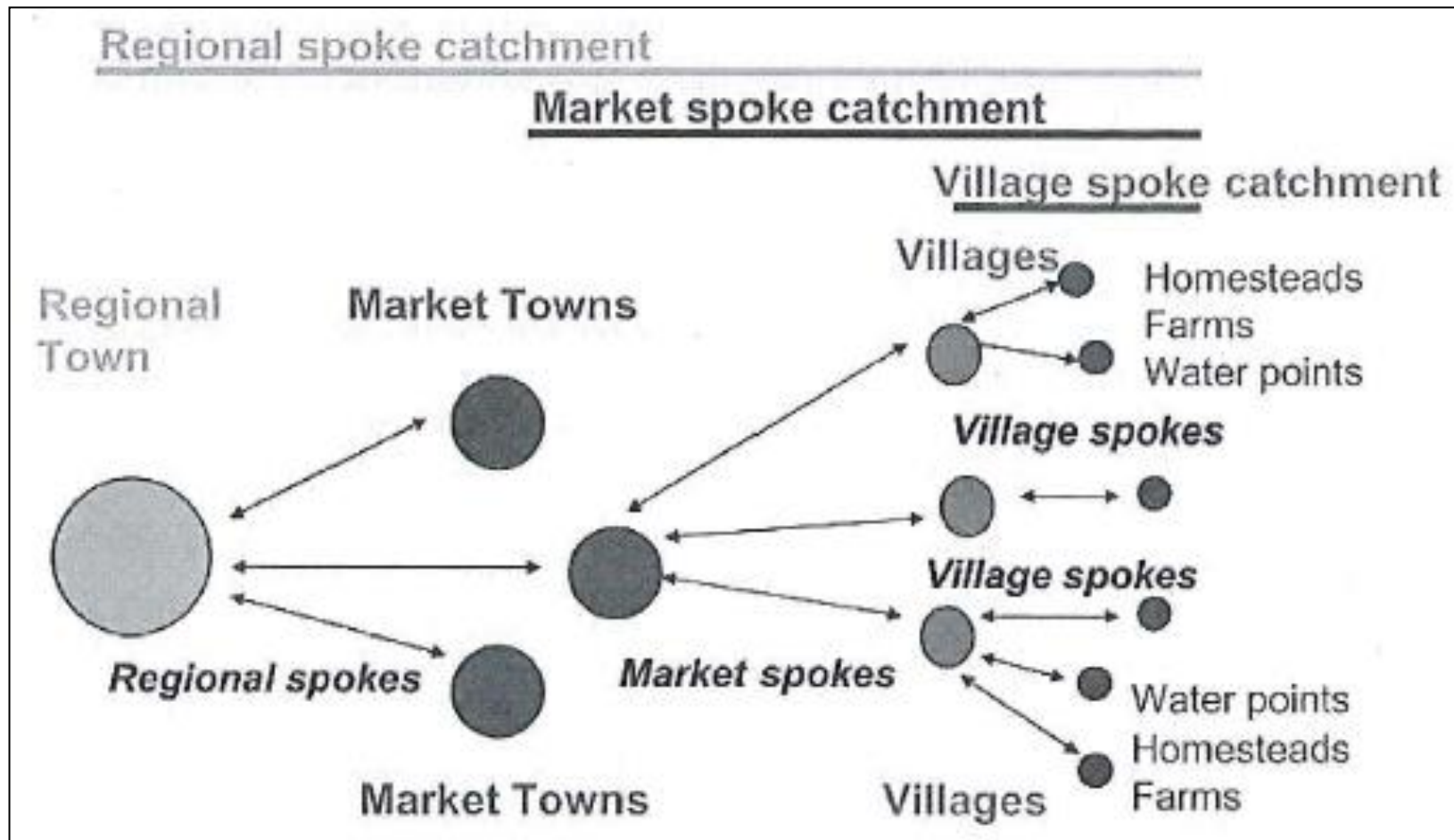


Simple hub and spoke model



Complex hub and spoke model

Source: Starkey (2007)



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AFCAP Rapid assessment method



- Rapid assessment of rural transport services involves:
 - Review of secondary information
 - Observations of actual transport situations
 - Interviews with key stakeholders (operators, regulators, users)
 - Traffic counts
- Data is geo-referenced using GPS to map the hubs, spokes, ‘invisible’ spokes and corridors
- Maps can model alternative transport scenarios

- AFCAP funded research being undertaken by IFRTD and Paul Starkey
- Aim is to identify, develop, test and share rural transport services indicators to assess how good RTS are at providing access for rural people
- Indicators may include:
 - Passenger fares
 - Frequency and journey time
 - Safety, security and comfort
 - Reliability, predictability and accessibility



Now read
Session 7.1
Notes!