PUBLIC OPEN SPACE AND PHYSICAL ACTIVITY:

HOW IMPORTANT IS DISTANCE, ATTRACTIVENESS AND SIZE?

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THE UNIVERSITY OF WESTERN AUSTRALIA


Corti Park
CITY OF SWAN
55
CITY OF SWAN
Let's make it happen


INCORPORATED
1705
To Help Preserve This Passive Open Space
Active Recreational Activities are Prohibited
LONGWOOD MALL
Please!
No Picnicking • No Ball Playing
No Dogs Allowed
Police Take Notice • Town of Brookline
17 7 2003


For everyone's enjoyment
The following are prohibited on the beach
No dogs
No ball games
No frisbees
No kites
No glass
No littering

Presentation

- Prevalence of public open space as a venue for physical activity
- What factors influence the use of public open space by adults?
- Methods
- Results
- Concluding remarks

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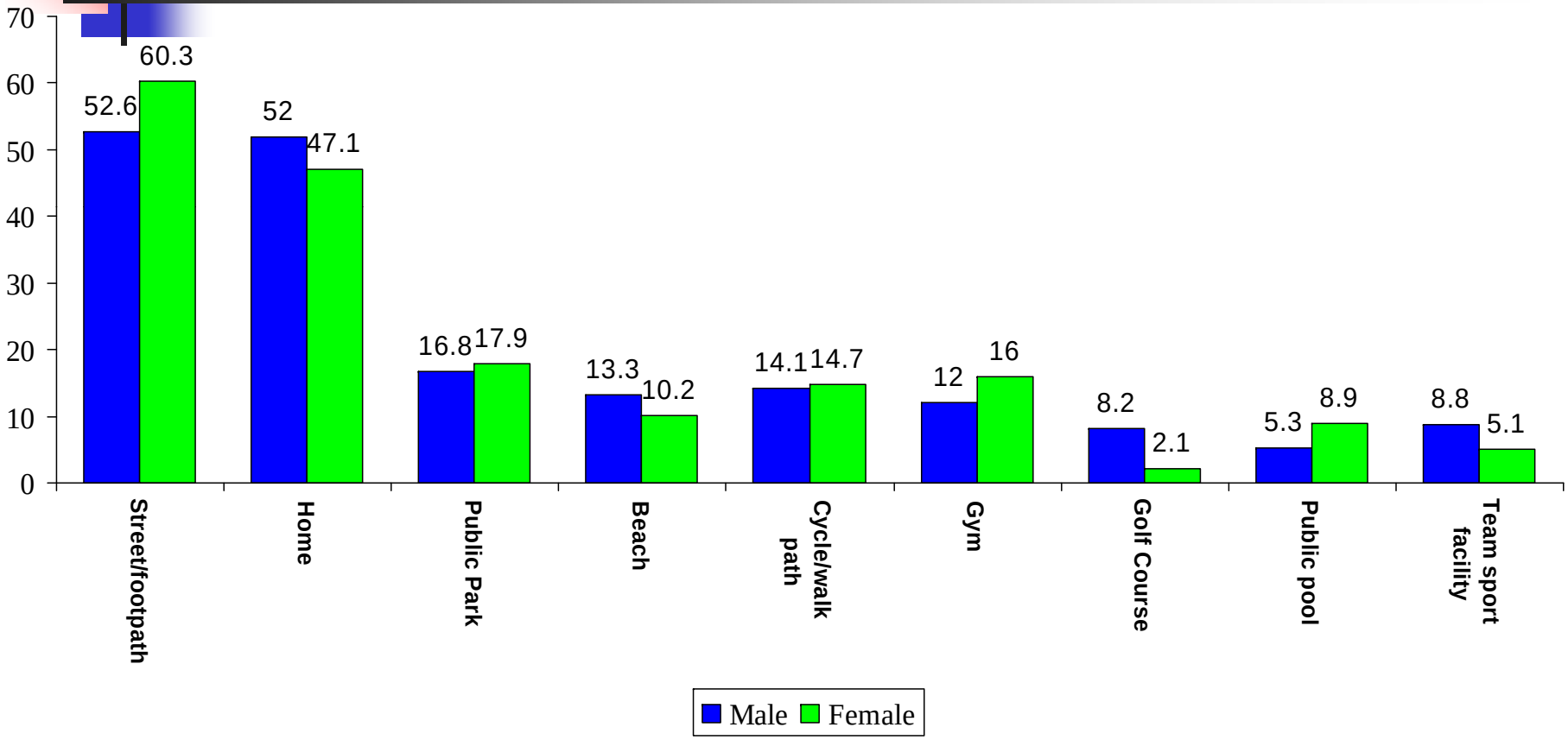
Facilities used for physical activity by gender



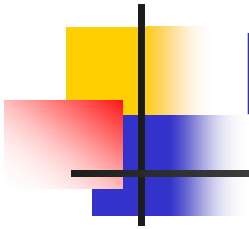
McCormack et al, Physical activity levels of Western Australian Adults, 2003

www.patf.dpc.gov.au

Factors influencing use of parks for physical activity

Corti, Donovan, Holman Health Prom J Aust 1996:6(1):16-21

- Aesthetic features
  - lakes
  - bird life
  - trees
- Variety
- Amenities
- Size
- Proximity
- Accessibility
- Personal motivation

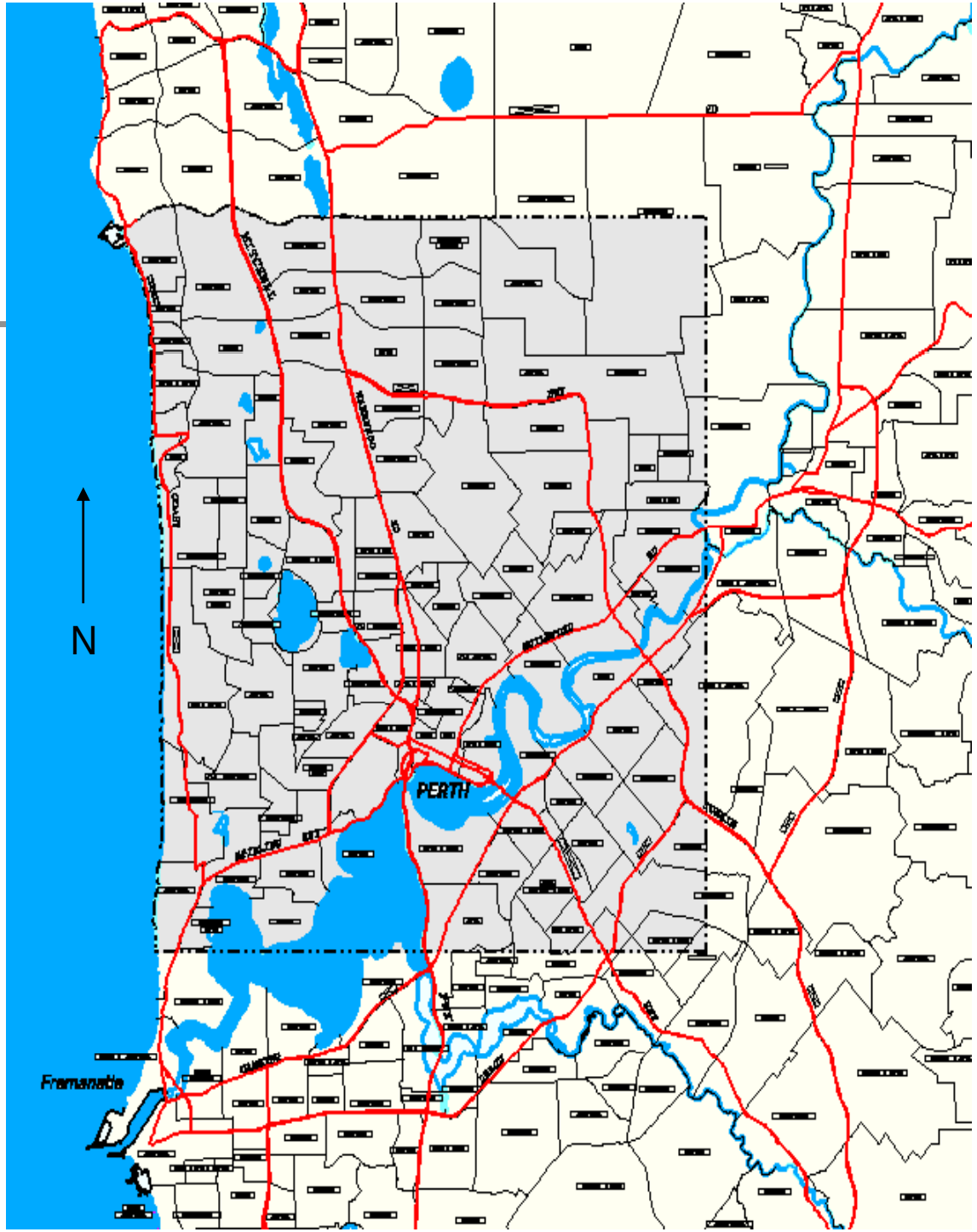


Method

Study Design

- Environmental scan study (Broomhall, 1996)
  - 516 public open spaces over 2 acres
  - Data collected on presence of attributes
  - Attributes weighted
  - Each public open space scored/100
- Random cross sectional survey
  - n=1803 adults aged 18-59 years 52.9% response rate; sampled high and low SES areas
  - Physical activity including walking and venue used

Study area



Gravity model

$$\mathbf{A_i} = \sum_j \boldsymbol{m}_j / \boldsymbol{d}_{ij}^{\beta}$$

Models tested

- Distance only

$$A_i = \sum_j 1 / d_{ij}^{\beta}$$

- Distance plus attractiveness

$$A_i = \sum_j m^{\alpha}{}_j / d_{ij}^{\beta}$$

- Distance plus attractiveness and size

$$A_i = \sum_j m^{\alpha}{}_j s_j^{\lambda} / d_{ij}^{\beta}$$

where α = 0.517, λ = 0.848, β =1.91

Factors influencing use of public open space for physical activity

Level	Size	Aesthetics	Safety	Amenities[1]
Macro				
Micro				

[1]For children's physical activity, the presence of children's play equipment measured at the macro level and condition of equipment at the micro-level

Environmental scan – quality POS Tool score

Level	Size	Aesthetics	Safety	Amenities[1]
Macro	✓	**Proximity to beach or river** **Water feature present**	**Lighting** **Quiet surrounding roads** Visibility from road	**Sporting facilities present (e.g., football, tennis)** **Walking paths present** **Availability of shade for walking**
Micro		**Birds life present** Placement and number of trees Graffiti	Access to crosswalks	Seating Drinking fountains

[1]For children's physical activity, the presence of children's play equipment measured at the macro level and condition of equipment at the micro-level

Weights applied to park attributes

Shade trees	16.9
Reticulated lawns	15.3
Walking paths	13.9
Sports facilities	13.9
Near beach/river	13.1
Water feature	8.3
Quiet roads	8.0
Lighting	6.8
Birdlife	3.8

Modified from Broomhall, 1996.

Dependent variables

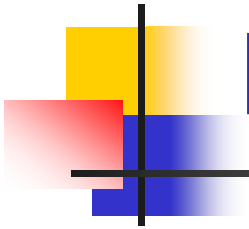
Variable	Definition
Use of public open space	Used POS for physical activity in previous two weeks
Sufficient physical activity	Equivalent 30 minutes daily moderate activity (>=840 MET●minutes/week)
Walking as recommended	5 walking sessions/week totalling 150+ minutes
High levels of walking	6 walking sessions/week totalling 180+ minutes

Independent variables[1]

Variable	Definition
Use of public open space	Used POS for physical activity in previous two weeks
Access to public open space (using 3 models[2])	Quartiles of access Very poor access (Bottom quartile access) Poor access (2nd bottom quartile) Good access (2nd top quartile) Very good access (Top quartile)

[1]Adjusted for age, sex, number of children under 18 at home, Education and SES area of residence

[2]Distance only, Distance plus attractiveness, Distance, attractiveness and size



Results

Sample

- Age range 18-59 years (54.6% <= 39 years; 44.3% 40-59)
- Disadvantaged area of residence: 48.5%
- 67.9% females
- Education
  - 21.5% sub-secondary education
  - 23.5% secondary
  - 5.4% trade
  - 22.5% certificate
  - 27% tertiary
- No children under 18 years at home: 51.7%

POS attributes

- Average Quality of POS tool score/100 = 47.5 (SD 9.3)

- Average size of POS (hectares) = 6.2 (SD 11.1)

Behaviours

- 28.8% used POS in last two weeks
- 59.2% sufficiently active
- 22.0% 5 sessions walking totalling 150+ minutes
- 17.3% 6 sessions wallking totalling 180+ minutes

Association between **use of public open space** and access (odds ratios)[1]

	Distance only model	Distance and attractiveness model	Distance, attractiveness & size model
Very poor access	1.00		
Poor access	1.28 (0.94-1.76)		
Good access	**1.87** (1.38-2.53)		
Very good access	**1.87** (1.37-2.54)		

[1]Adjusted for age, sex, number of children under 18 at home, education and SES area residence

Association between **use of public open space** and access (odds ratios)[1]

	Distance only model	Distance and attractiveness model	Distance, attractiveness & size model
Very poor access	1.00	1.00	
Poor access	1.28	1.03 (0.76-1.41)	
Good access	**1.87**	**1.67** (1.23-2.25)	
Very good access	**1.87**	**1.62** (1.20-2.19)	

[1]Adjusted for age, sex, number of children under 18 at home, education and SES area residence

Association between **use of public open space** and access (odds ratios)[1]

	Distance only model	Distance and attractiveness model	Distance, attractiveness & size model
Very poor access	1.00	1.00	1.00
Poor access	1.28	1.03	0.90 (0.65-1.23)
Good access	**1.87**	**1.67**	1.20 (0.88-1.64)
Very good access	**1.87**	**1.62**	**2.05** (1.52-2.75)

[1]Adjusted for age, sex, number of children under 18 at home, education and SES area residence

Association between **use POS** and physical activity behaviour (odds ratios)[1]

Variable	Sufficient physical activity	Walking 5+ sessions for 150 min+/wk	Walking 6+ sessions for 180 min+/wk
Use public open space			

[1]Adjusted for age, sex, number of children under 18 at home, education and SES area residence

Association between **use POS** and physical activity behaviour (odds ratios)[1]

Variable	Sufficient physical activity	Walking 5+ sessions for 150 min+/wk	Walking 6+ sessions for 180 min+/wk
Use public open space	**2.66** (2.10-3.37)	**2.78** (2.19-3.54)	**2.82** (2.17-3.67)

[1]Adjusted for age, sex, number of children under 18 at home, education and SES area residence

Association between **access POS[1]** and physical activity behaviour (odds ratios)[2]

Access to POS	Sufficient physical activity[1]	Walking 5+ sessions for 150 min+/wk	Walking 6+ sessions for 180 min+/wk
Very poor access			
Poor access			
Good access			
Very good access			

[1]Based on distance, attractiveness and size model

[2]Adjusted for age, sex, number of children under 18 at home, education and SES area residence

Association between **access POS[1]** and physical activity behaviour (odds ratios)[2]

Access to POS	Sufficient physical activity[1]	Walking 5+ sessions for 150 min+/wk	Walking 6+ sessions for 180 min+/wk
Very poor access	1.00		
Poor access	0.82 (0.62-1.09)		
Good access	0.73 (0.55-0.96)		
Very good access	0.91 (0.68-1.20)		

[1]Based on distance, attractiveness and size model

[2]Adjusted for age, sex, number of children under 18 at home, education and SES area residence

Association between **access POS** and physical activity behaviour (odds ratios)[1]

Access to POS	Sufficient physical activity[1]	Walking 5+ sessions for 150 min+/wk	Walking 6+ sessions for 180 min+/wk
Very poor access	1.00	1.00	
Poor access	0.82	0.98 (0.70-1.36)	
Good access	0.73	1.19 (0.86-1.65)	
Very good access	0.91	1.23 (0.89-1.69)	

[1]Adjusted for age, sex, number of children under 18 at home, education and SES area residence

Association between **access POS** and physical activity behaviour (odds ratios)[1]

Access to POS	Sufficient physical activity[1]	Walking 5+ sessions for 150 min+/wk	Walking 6+ sessions for 180 min+/wk
Very poor access	1.00	1.00	1.00
Poor access	0.82	0.98	0.73 (0.50-1.08)
Good access	0.73	1.19	1.11 (0.77-1.59)
Very good access	0.91	1.23	**1.50 (1.06-2.13)**

[1]Adjusted for age, sex, number of children under 18 at home, education and SES area residence

Observational Study

Ng, Douglas, Collins (2002)

Methods (Ng, Douglas, Collins 2002)

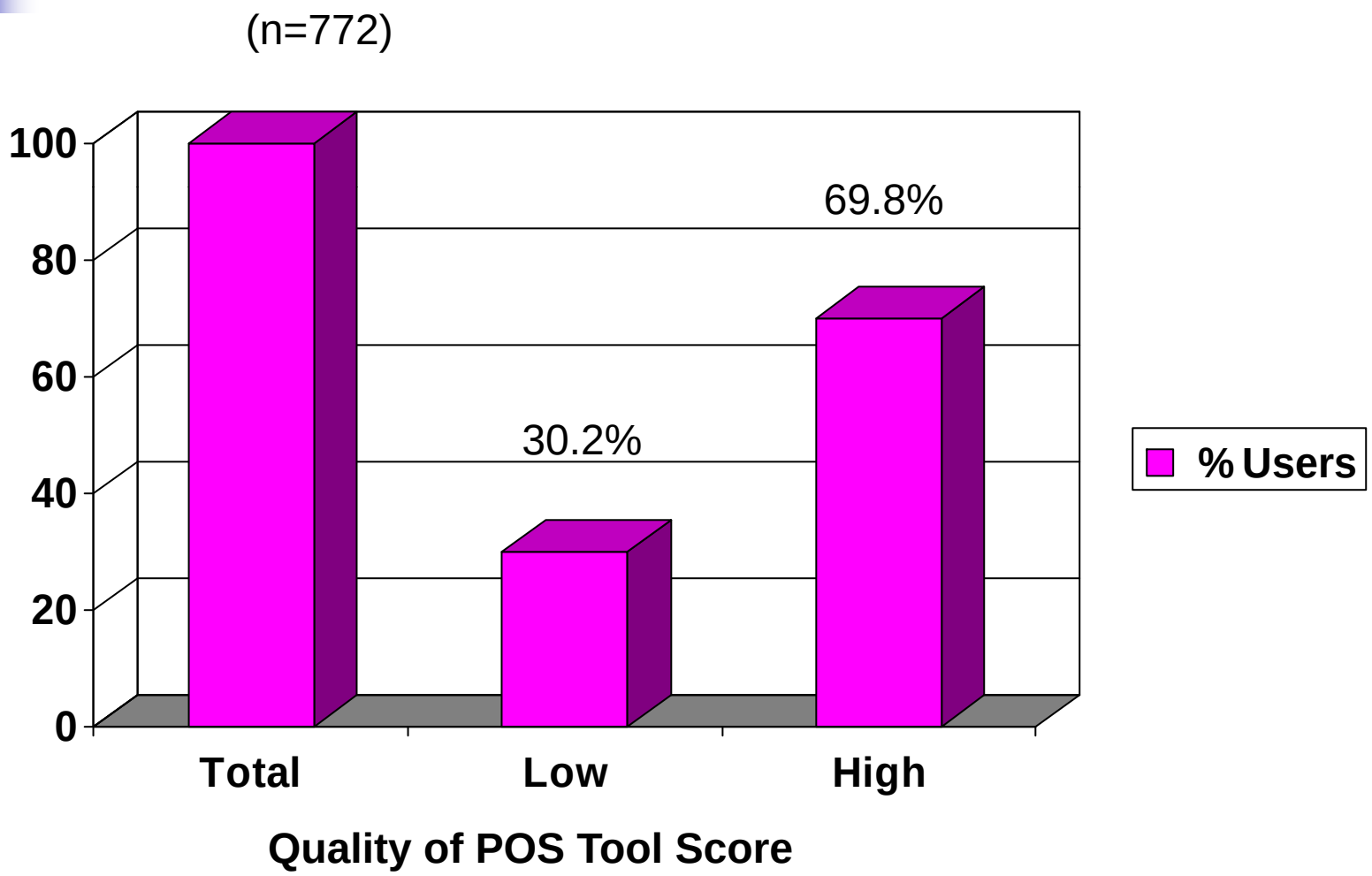
- Continuous observation six pairs of POS
- Each pair
  - Matched on
    - SES (high, medium and low)
    - Size (all less than 6 hectares)
  - Stratified by quality of POS score i.e., high and low (30 point difference)

Methods (Ng, Douglas, Collins (2002)

- Each pair observed *same* Saturday 0730-1730 - two half-hour breaks at specified times
- Weather fine: 20-32 degrees Celsius
- Observational tool:
  - Estimated age, gender, activity, time spent at POS
- Observers trained
- Inter-rater reliability assessed - high levels of agreement between four observers

Prevalence of POS users by Quality of POS Tool scores

(Ng, Douglas, Collins 2002)



Concluding remarks

- Limitations
  - High and low SES areas only
  - 18-59 year old population
  - Lack of variability in environmental data
  - Is model of ‘accessibility’ appropriate?
  - Method for developing weighting of attributes

Concluding remarks

- Proximity (distance) influences use of POS, but alone, not necessarily achieving recommended levels of activity or walking
- The size of POS (and possibly its attractiveness) appears to be related to higher levels of walking
- Role of attractiveness in gravity model requires more development
  - Preliminary evidence – when matched for size, more people use attractive POS


Attention
Dog Guardians
Pick up after your
dogs. Thank you.
Attention Dogs
Grrrrr, bark, woof.
Good dog.
District of North Vancouver.
Bylaw 5981-11(i)


Thank you for your attention.
Any questions?
GYM
FRESH WORDS DAILY
More information?
billie@cyllene.uwa.edu.au
Leunig

Decay of distance

	β
Public open space	1.91
River	1.71
Tennis court	1.64
Beach	1.48
Gym/health club	1.39
Swimming pool	1.27
Sport/Rec complex	1.16