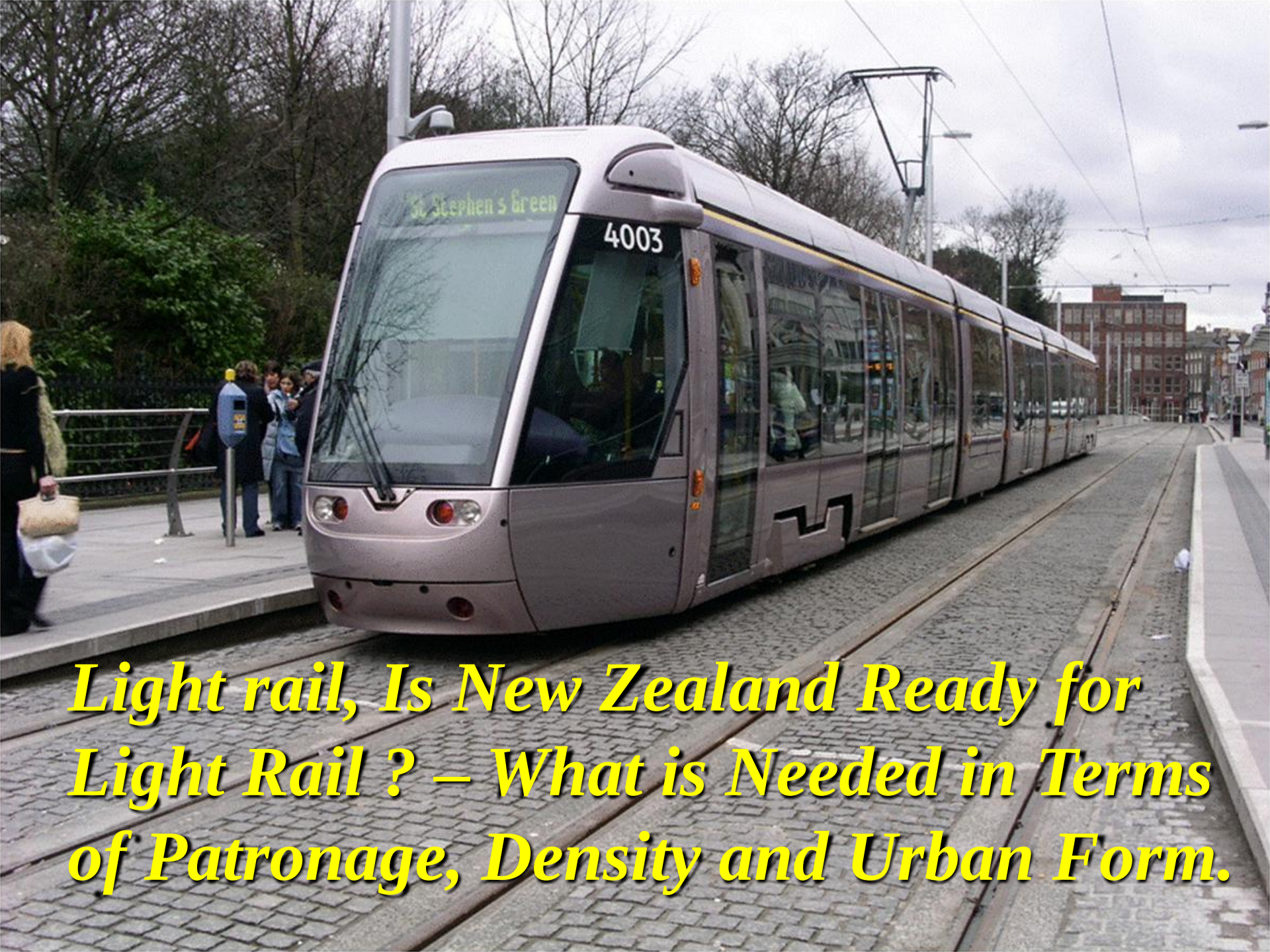
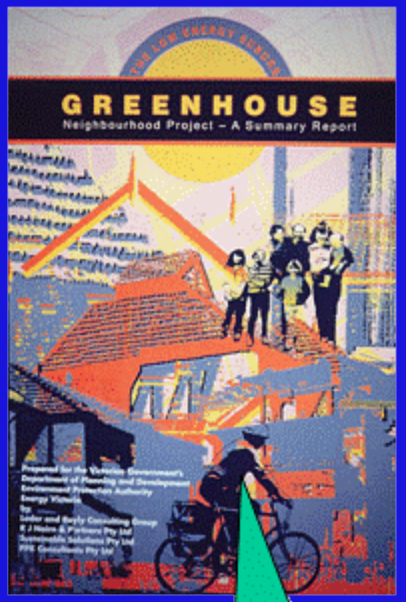


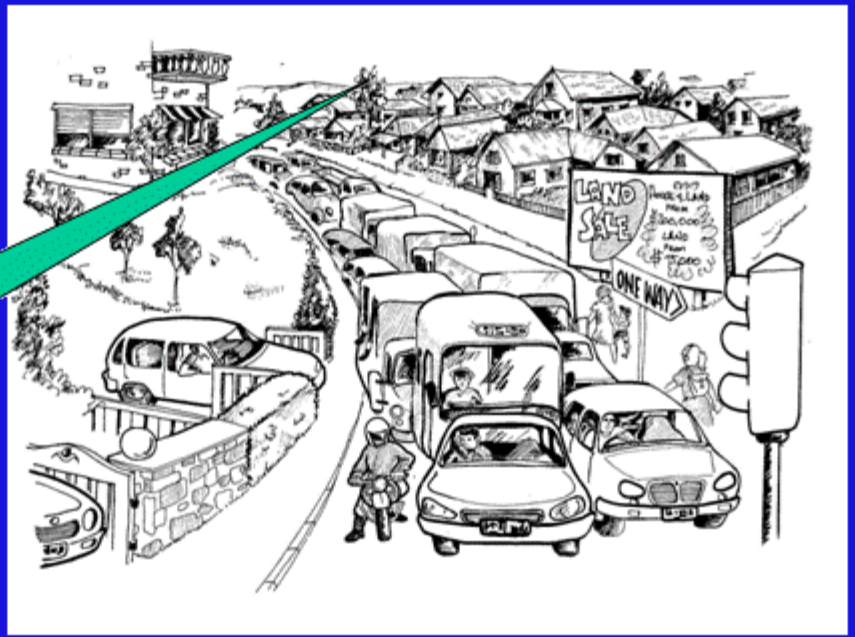
Light rail, Is New Zealand Ready for Light Rail ? – What is Needed in Terms of Patronage, Density and Urban Form.

THE PROBLEM

Too Many Car Based Trips



Greenhouse Gas Emissions



Urban Sprawl

LIGHT RAIL THE SOLUTION ?

INTRODUCTION

Light rail transit (LRT) provides the opportunity to run uninterrupted through busy streets, in built-up areas, with limited environmental/social disturbance and easy access for all members of the community.

LRT represents a real opportunity for urban society to reduce its dependency on the car.

WHY HAS LIGHT RAIL BEEN SO EFFECTIVE ?

The success of light rail along defined corridors, can be attributed to its modern, often futuristic vehicles, perception of reliability, quietness, ease of access, climatic controls, and environmentally friendly nature.

Plus the flexibility to be able to go next to where people live and where they want to go.

Basically, light rail appears a trendy new way to travel around our cities, compared to the car. The people love it !

THE DIFFERENCE BETWEEN

A Tram

And
Light Rail

Why Not a Bus?

POTENTIAL TO CARRY UPTO 275 PASSENGERS, PER CAR SET, IN TOWN AT 30kph & 100kph OUT SIDE

LRT'S IMPACT ON MODE SPLIT

In Calgary, Canada, for example, the southern LRT line has attracted 22% of its patrons as previous car users.

In Paris, 6% are former car users and 14% are new travellers using the LRT for trips home for lunch, etc, not previously undertaken.

ATTRIBUTES AIDING LIGHT RAIL'S EFFECTIVENESS

LRT VEHICLES ARE QUIET, LIGHT, CLEAN, MODERN & FUTURISTIC
(picture un-available)

STREET RUNNING IN HEAVY TRAFFIC (SHEFFIELD)

(picture un-available)

STREET RUNNING IN GRENOBLE (FRANCE) WITH PRIORITY

(picture un-available)

STREET RUNNING WITH PRIORITY TO LRT & BUSES

(picture un-available)

GRADE & GRADE SEPARATED RUNNING (SHEFFIELD) IN OWN RIGHT OF WAY

(picture un-available)

ELEVATED TRACK
(LONDON DOCKLANDS)
(picture un-available)

FULLY AUTOMATED LRT (VAL SYSTEM IN LILLE)

(picture un-available)

LRT TRAVELS UNDERGROUND IN DOWNTOWN SAN FRANCISCO

(picture un-available)

OWN RIGHT OF WAY (FORMER HEAVY RAIL TRACK AND STATIONS)

(picture un-available)

RUNNING THROUGH OPEN SPACE IN STRASBOURG

(picture un-available)

PRIORITY FOR LIGHT RAIL

(picture un-available)

SIGNALISED INTERSECTIONS WITH OR WITHOUT PRIORITY TO LIGHT RAIL

(picture un-available)

HEAVY RAIL TRAINS AND LRT VEHICLES SHARE TRACK AND POWER IN KARLSRUHE

(picture un-available)

SHARING HEAVY RAIL TRACK AT SAARBRUCKEN

Picture un-available

ACCESS ISSUES

LOW FLOOR ENTRY VEHICLES

(picture un-available)

LOW LEVEL FLOOR ACCESS FOR ALL INCLUDING THE DISABLED (GRENOBLE)

(picture un-available)

LOW LEVEL PLATFORMS INTEGRATED WITH FOOTPATHS (STRASBOURG)

(picture un-available)

SUPPORT FACILITIES

FEEDER BUSES & PARK RIDE FACILITIES IN CALGARY

LRT INTERCHANGE WITH HEAVY RAIL AT MAJOR STATION (MANCESTER)

INTEGRATED TICKETING IS FUNDAMENTAL

(picture un-available)

SECURITY POLICE ON ONE OF LA'S BLUE LINE STATIONS.
(picture un-available)

STATION ALARMS

(picture un-available)

MODERN WELL EQUIPPED MAINTENANCE DEPOT IN SALT LAKE CITY

(picture un-available)

Close integration of light rail stations with where people live and where they want to go.

ROUTE ALIGNMENT NEXT TO MAJOR ATTRACTORS

(picture un-available)

CLOSE INTEGRATION WITH TOURIST ACCOMMODATION

(picture un-available)

CLOSE INTEGRATION WITH WHERE PEOPLE LIVE

(picture un-available)

RESIDENTIAL APPARTMENTS IN ULTIMO ADJACENT TO STATION (SYDNEY)

(picture un-available)

OFFICES ADJACENT TO STATION (LONDON DOCKLANDS)
(picture un-available)

LIGHT RAIL ADJACENT TO STUDENT CAMPUS (NANTES)

LRT INTERCHANGE WITH A MAJOR SHOPPING COMPLEX

(picture un-available)

LRT NEEDS TO BLEND SUCCESSFULLY INTO THE LOCAL LANDSCAPE TO AID ACCEPTANCE

LIGHT RAIL CAN BLEND WITH ATTRACTIVE SETTINGS
(picture un-available)

STATIONS DESIGNED TO BLEND WITH LOCAL ARCHITECTURE (GRENOBLE)

(picture un-available)

BLENDING INTO THE URBAN FABRIC (GRENOBLE)

picture un-available

COBBLE STONE PAVEMENT TO BLEND IN WITH LOCAL ARCHITECTURE (PORTLAND)

(picture un-available)

SO HOW MANY PEOPLE ARE USING LIGHT RAIL ?

DAILY PASSENGER VOLUMES CAN BE HIGH (63,000 per day in Paris, three times that formerly by bus)

PATRONAGE LEVELS IN NORTH AMERICA & EUROPE

Journeys per day	System	Length km	Journeys per day per km
82,000	Croydon	27	3,050
248,000	Calgary	45	5,520
230,000	Grenoble	34	6,760
288,000	Rouen	43	6,650
62,700	Denver	56	1,113
41,300	Salt Lake	30	1,355
42,000	Edmonton	13	3,415
107,600	Portland	71	1,515

Calgary City an example of a successful LRT system

- Current City population around 1 million people
- Nearly 250,000 boardings per day
- Highest LRT patronage of any city in North America
- Low cost so far of only $550 million
- Started LRT in 1981 when the city had a population of only 592,000

NEW LRT SYSTEMS EXCEED PREDICTED DEMAND

- **In Strasbourg, predicted daily users in the first year of operation was 54,000, however,within 11 months of operation, figures exceeded 63,000**

- **In Paris, predicted daily use was 55,000 in the first year, but 60,000 was achieved.**

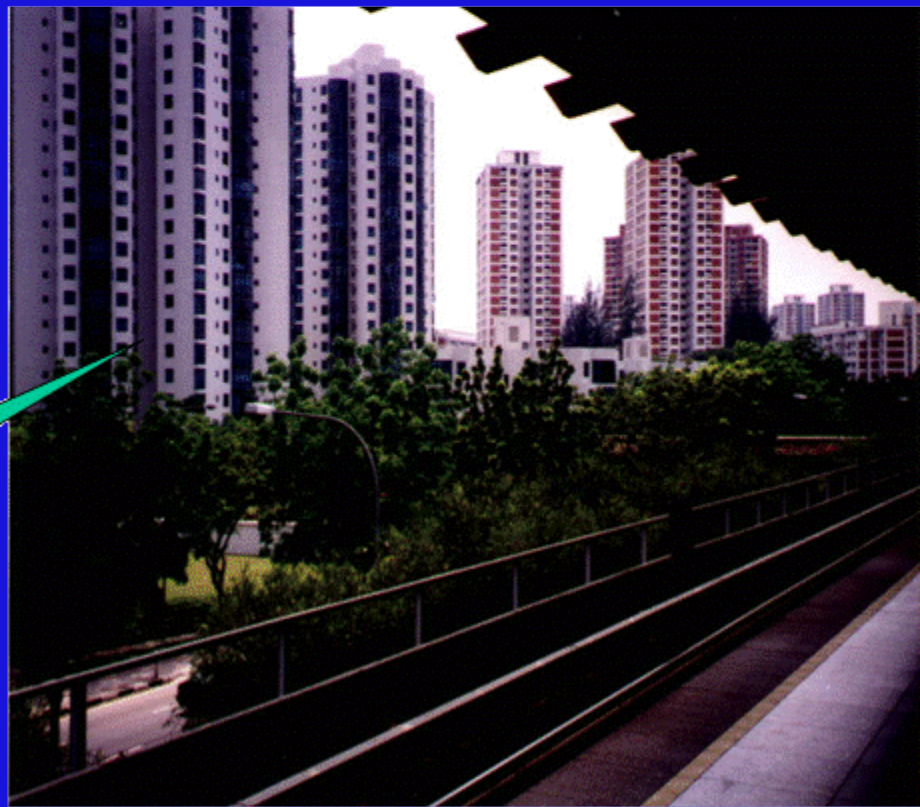
- **In Phoenix, predicted daily users in the first year was 25,000, it achieved 40,000 within six months.**

Integration with Land Uses as Transit Oriented Developments

PLANNING INTERVENTION

TOD STYLE DEVELOPMENT ON THE LONDON DOCKLANDS (PPG 13)

HIGH DENSITY AROUND RAIL STATIONS IN SINGAPORE



MARKET INTERVENTION

RESIDENTIAL APPARTMENTS IN ULTIMO ADJACENT TO STATION (SYDNEY)

RESIDENTIAL DEVELOPMENTS ADJACENT TO STATIONS (SAN DIEGO)

HONG KONG :
DEVELOPMENTS ABOVE STATIONS USED TO FUND NEW AIRPORT LINK

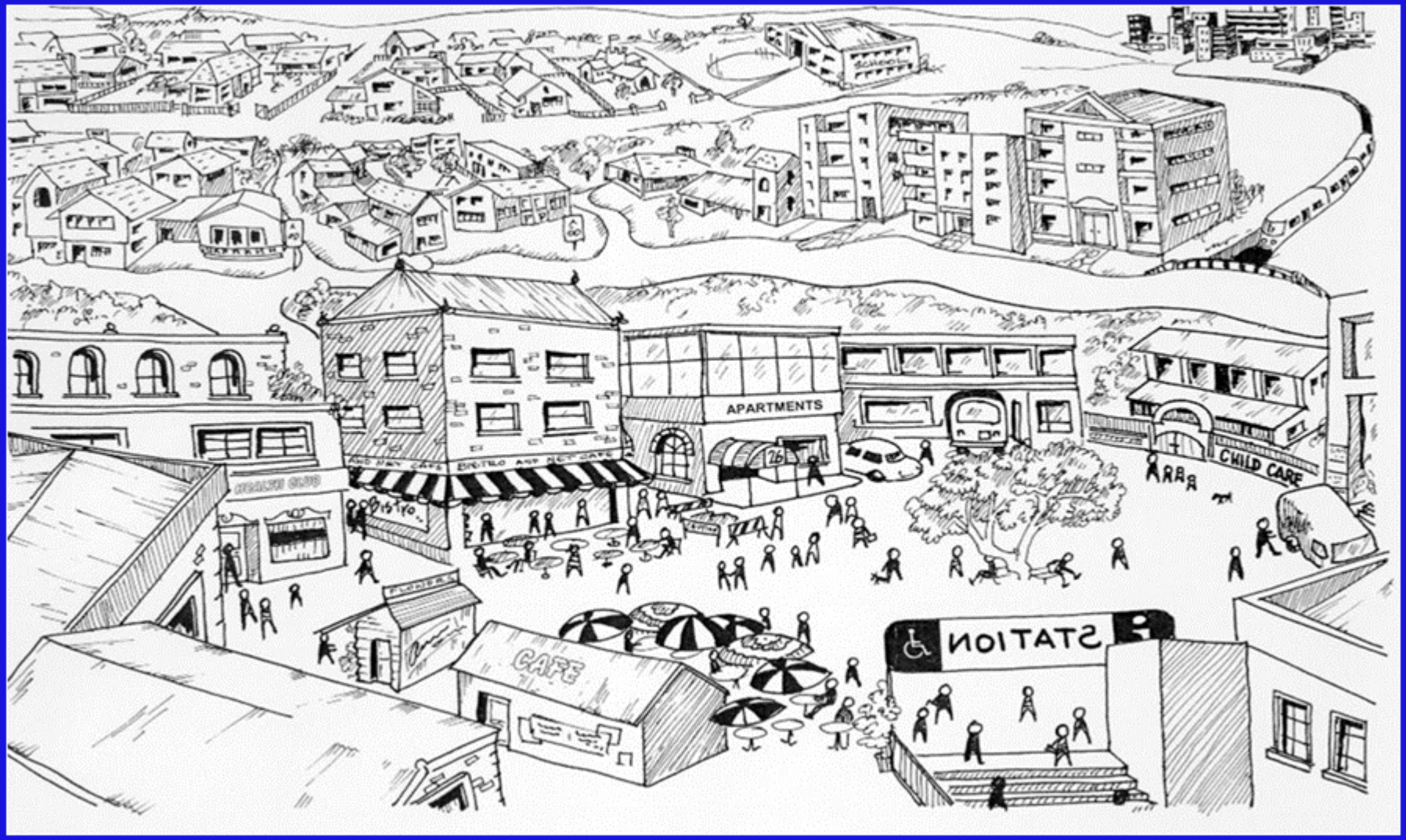
SAN DIEGO:GOVERNMENT OFFICE ABOVE LRT STATION

GOVERNMENT INTERVENTION

TRANSIT ORIENTED DEVELOPMENTS

- **Transit Oriented Developments are a key factor in land use and transport integration with LRT.**
- **The UK, Europe, USA and Asia are advancing in transit oriented developments.**
- **The New Starts Program is now creating a positive move towards transit oriented developments in the USA.**

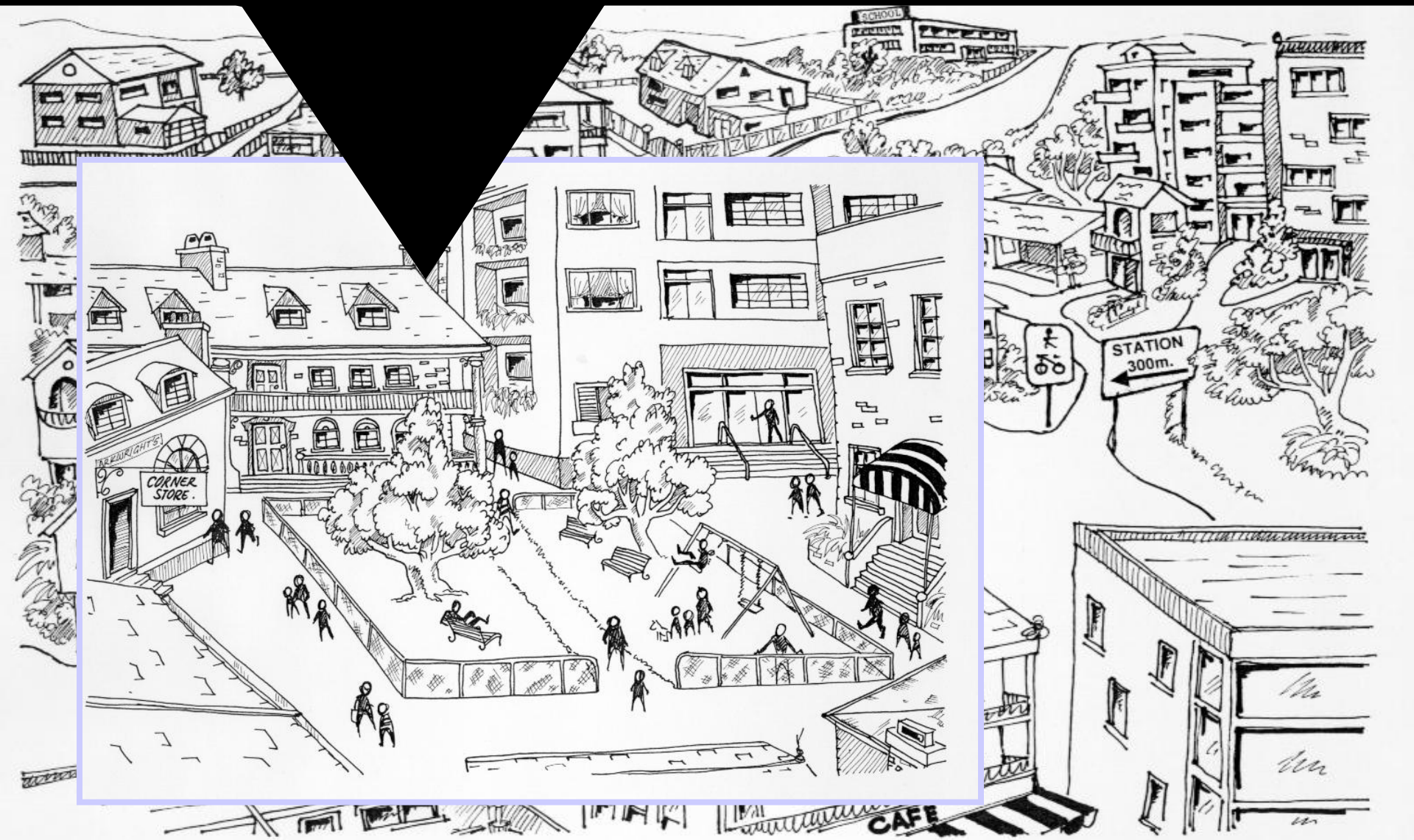
A Transit Oriented Sustainable Urban Development



TOD Images Presented to the Public

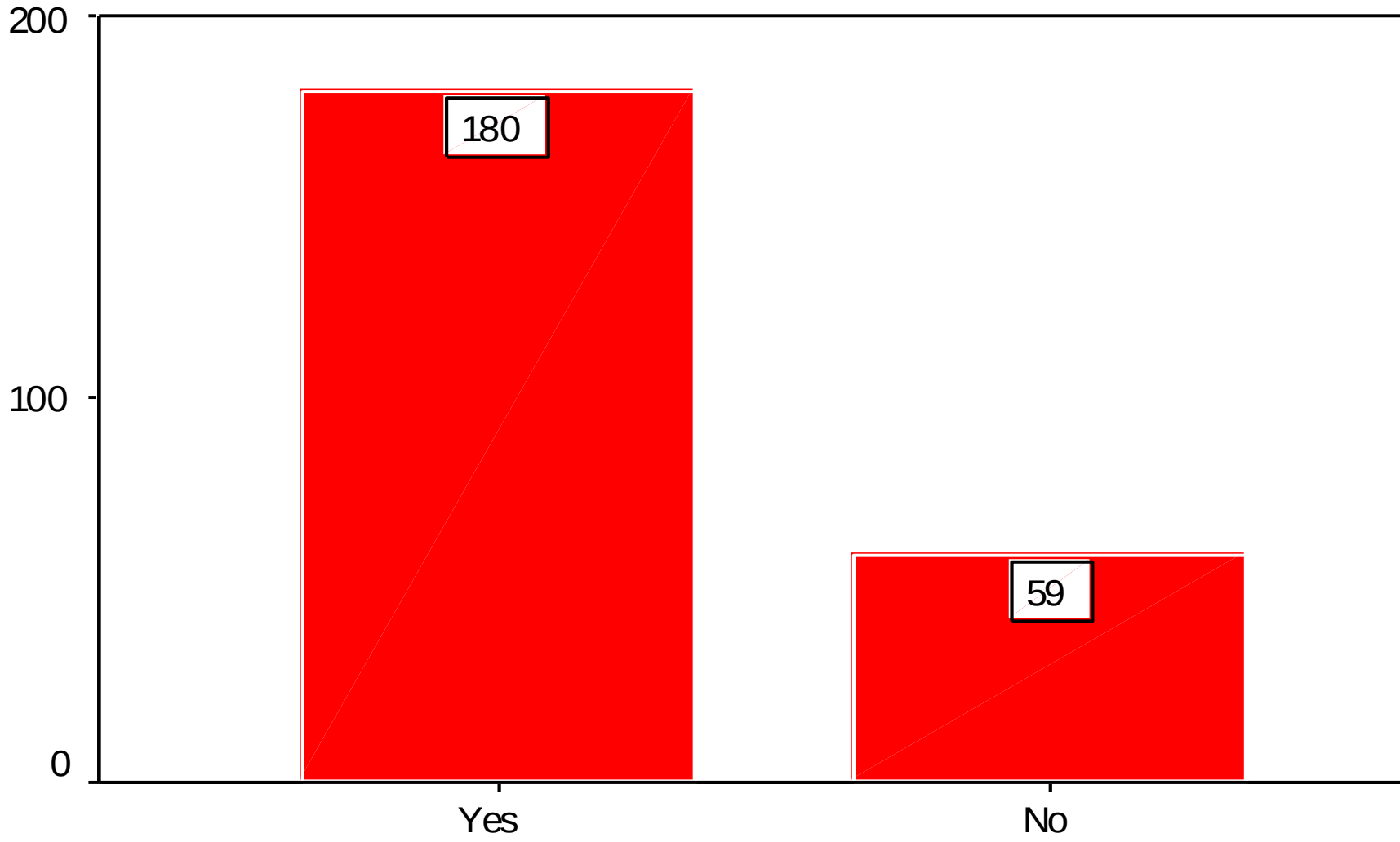
A close up of the market plaza area around the station.

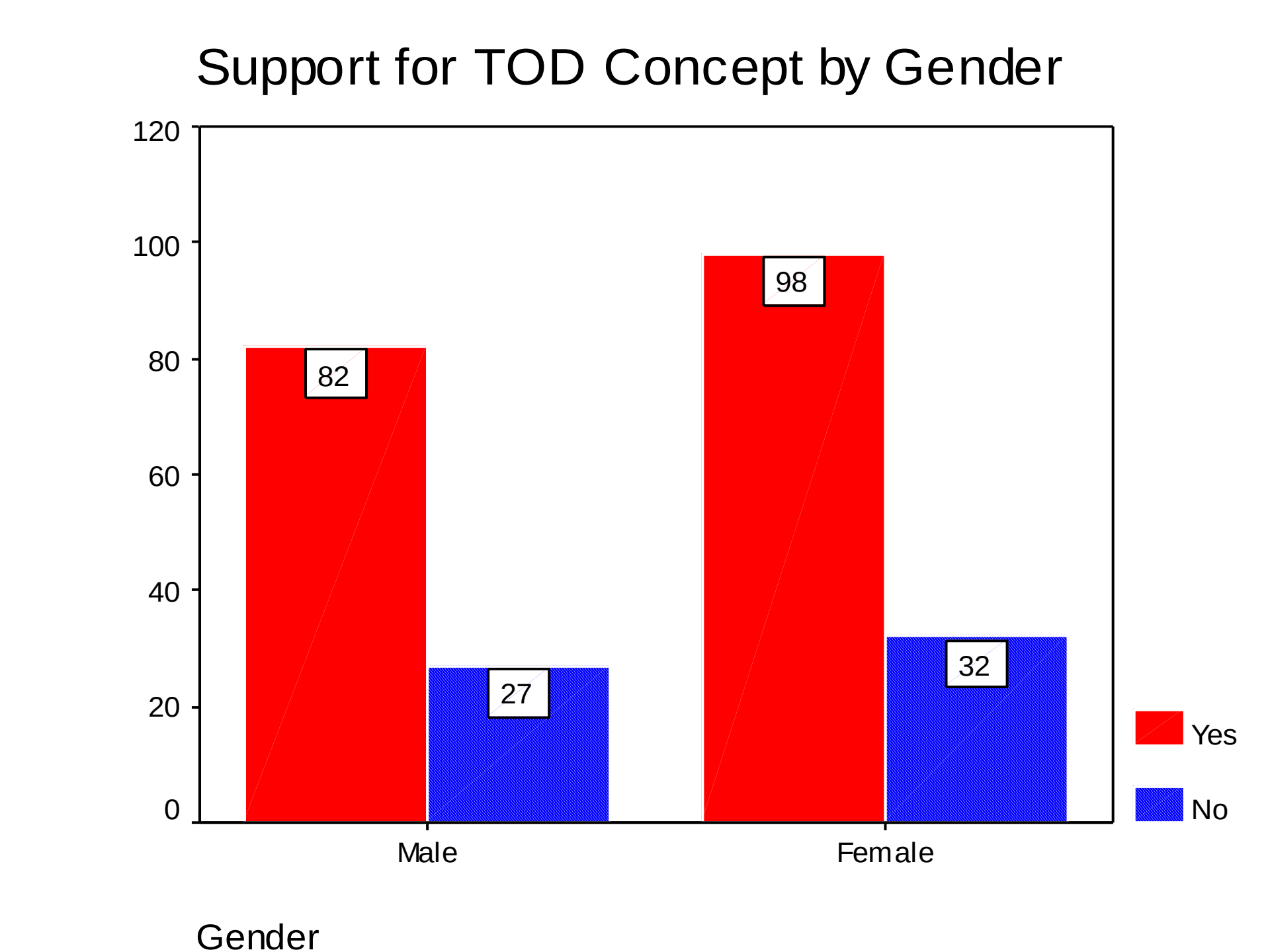
A park area about 200/300 metres from the main station/plaza, which has townhouses, apartments, a corner retail store.



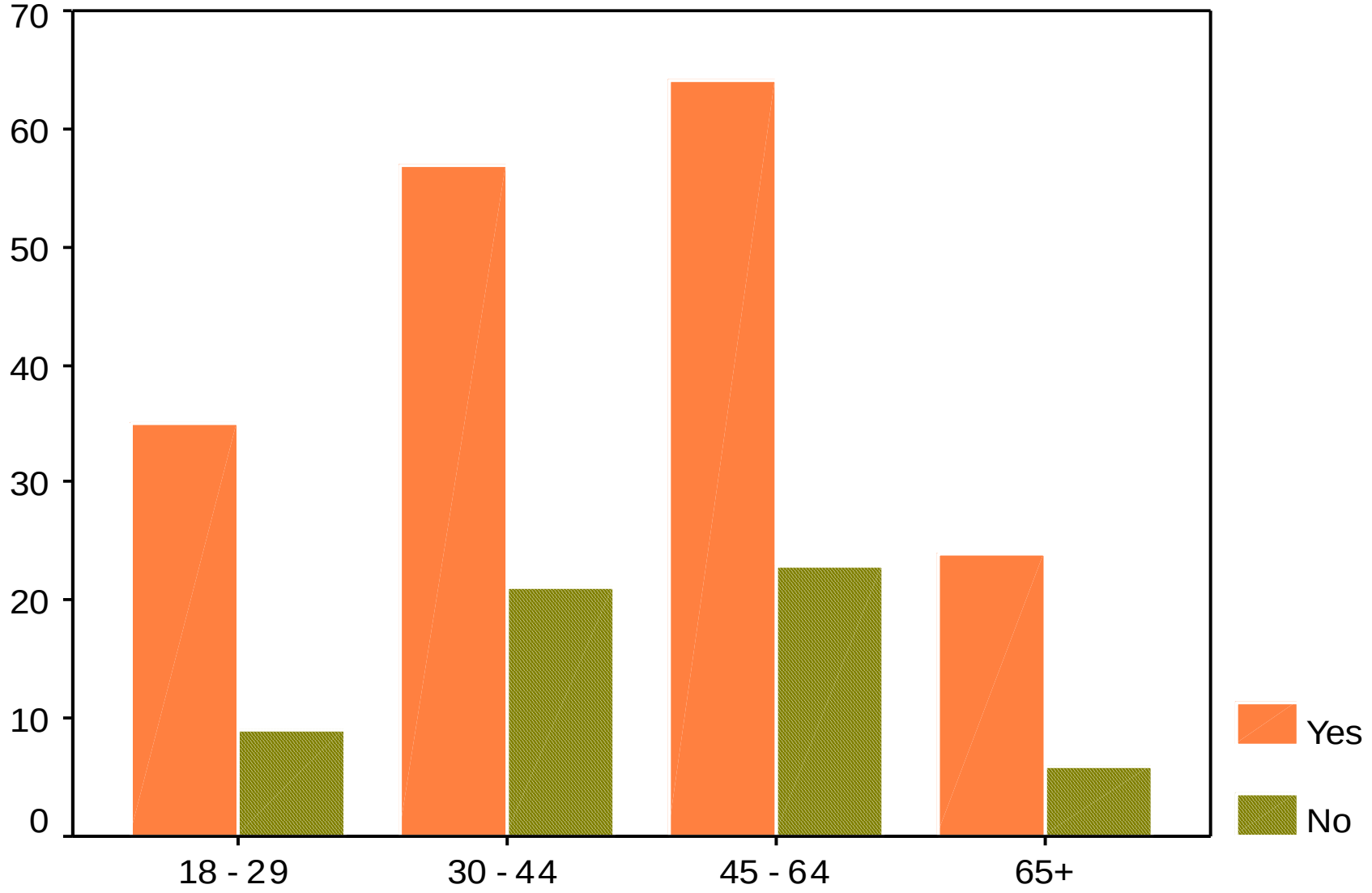
Public Response to TOD Concept

Support TOD concept Now or in the Future



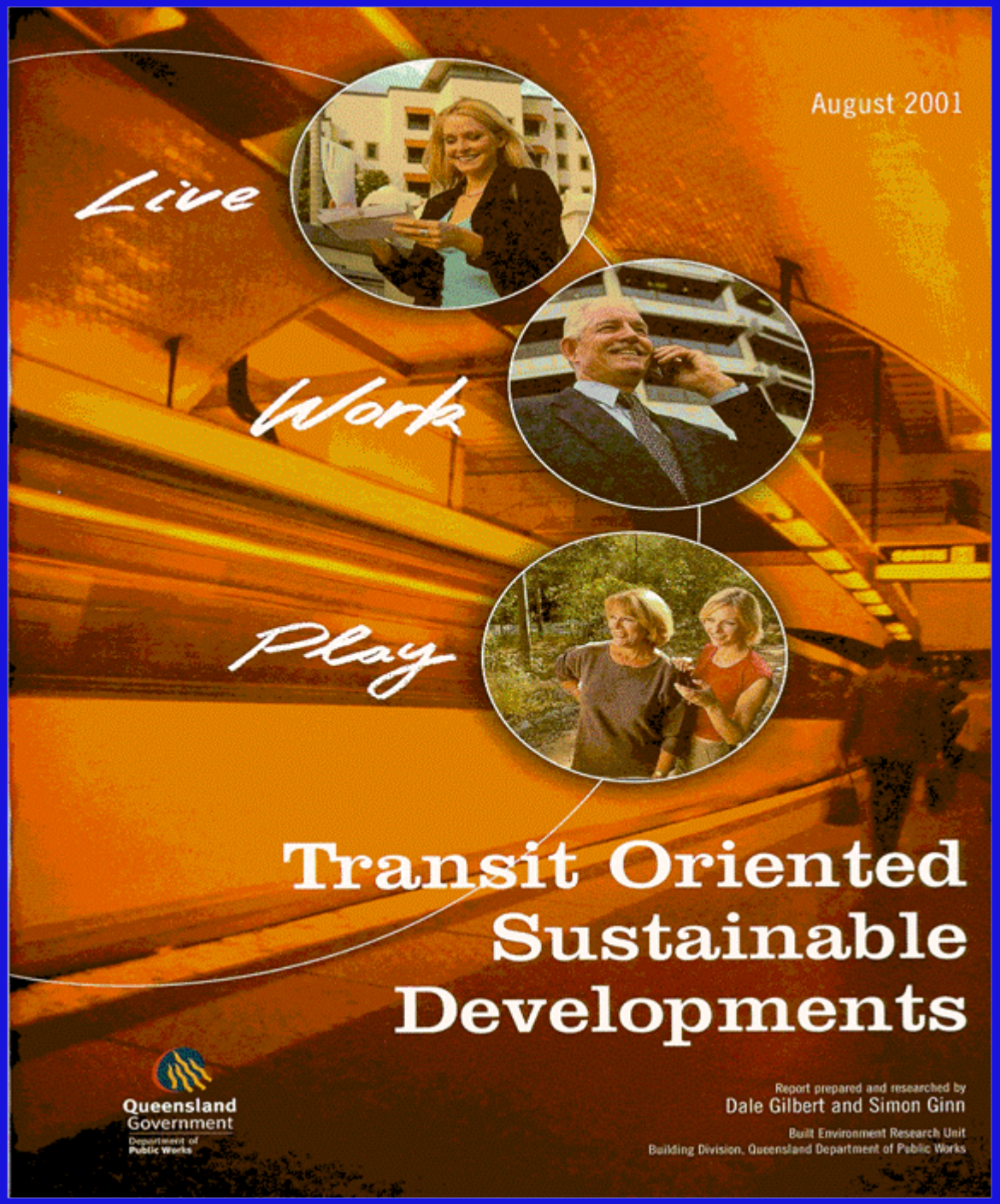

Support for TOD Concept by Gender
120
100
80
60
40
20
0
82
27
98
32
Male
Female
Gender
Yes
No

Support for TOD Concept by Age



TOD RESEARCH FINDINGS

- **Strong support for TOD Concept by the public and development market.**
- **Clear need for quality transit system to be provided by public authorities.**
- **TOD Concept needs to be supported in local planning schemes.**
- **Financial institutions need to have a more flexible approach to lending.**


August 2001
Live
Work
Play
Transit Oriented Sustainable Developments
Queensland Government
Department of Public Works
Report prepared and researched by
Dale Gilbert and Simon Ginn
Built Environment Research Unit
Building Division, Queensland Department of Public Works

POPULATION THRESHOLDS AND DENSITY

- **LRT needs a population base of at least 150,000 upwards.**

- **Its the density, however, that really matters, rather than some preconceived threshold. In Grenoble, France, a city of only 400,000, 20% of city's population and 27% of its workers are within 400 metres walking distance of LRT stations.**

SO WHAT IS A LIGHT RAIL TRANSIT SYSTEM GOING TO COST ? $$$$$

COMPARISON OF LIGHT RAIL BUILDING COSTS

Line	Cost	Cost in millions per Km NZ
Phoenix	US $1.4 billion	$62
Salt Lake City	US $1.1 billion	$52
Denver	US $880 million	$41
Portland	US $3.0 billion	$33
Edmonton	CAN $344 million	$32
Croydon	GP 230 million	$20
Calgary	CAN $548 million	$14

COST OF CONSTRUCTING A STANDARD LRT SYSTEM

With good planning, minimal land acquisition, and at grade running of vehicles, there is no reason why in New Zealand costs should not be kept around NZ$12 - 15 million per km over lengths in excess of 20 Kms

REDUCING LRT BUILDING COSTS

- **Using existing heavy rail tracks with only partial street running.**
- **Consider using diesel LRT vehicles that do not require over head power, sub stations, etc.**
- **The cost of LRT vehicle provision can be reduced if second hand rolling stock is used to start the network.**

COVERING COSTS

- **The initial capital cost must be written off.**
- **The cost of operating any public transport system is expensive, with daily operating expenses (variable costs) being covered, in part, by the fare box, and the rest commonly through government subsidies.**
- **Light rail, however, has the potential to effectively cover 100% of the costs of operating the system.**

THE CHALLENGE

- **Urban planners here will need to enable urban residential and commercial density to levels which can maximise demand within 400 metres of a stop.**
- **Those cities achieving good patronage have really attempted to integrate a number of land use attractors along the full alignment (for example: hospitals, schools, employment, and shopping centres) and not just in the CBD.**

CONCLUSIONS

- **LRT has the potential to help significantly shift the modal split in favour of public transport and reduce car dependency.**

- **To really be effective land use planning needs to facilitate appropriate settlement patterns and maximum densities along defined corridors.**

- **To keep costs down, existing heavy rail tracks need to be utilised and diesel LRT vehicles considered.**

So Who Wants to Drive?