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Urban Transportation, Land Use, and  
the Environment in Latin America:  
A Case Study Approach

*Class 10:*

*The Santiago Metropolitan Area*

# The Santiago Metropolitan Area (SMA)

Latitude:  $32^{\circ}56'$  –  
 $34^{\circ}17'$  South  
Longitude:  $69^{\circ}47'$  –  
 $71^{\circ}43'$  West



# The National Context

<b>Indicator</b>	<b>Chile</b>	<b>LAC</b>	<b>Upper Middle- Income Countries</b>
GNI per capita (US\$ 2000)	4,600	3,680	4,620
Urban Population	86	75	76
Life Expectancy at Birth	76	70	69
Infant Mortality (per 1000 births)	10	30	28
Access to Improved Water	94%	85%	87%
Illiteracy (15+)	4	12	10
Population AAGR (94-00)	1.4	1.6	1.3

Source: World Bank, 2001. *Chile at a Glance*.

# The National-Regional Context

- National Government

- Executive Branch

- Elected President – Majority of popular vote (run-off), one 6-year term
- Appointed Ministers

- Legislative Branch (Bi-cameral)

- Elected Representatives (*diputados*) – 160 from 60 electoral districtos – directly elected 4-year terms
- Elected (38), Appointed (9) and lifetime (2) Senators – directly elected serve 8-year terms

- 13 Regions, divided into Provinces

- Executive: Presidentially-appointed governors & Regional Arms of National Ministries
- Regional Councils, elected by Municipal Government Councils in form of Electoral College
- Provinces, Governor, with little power

# The Local Context - Decentralization

- The Municipality - government presiding over the *comuna*
- Formally established by law in 1991
  - Local municipal elections first held in June, 1992
  - 341 municipal governments across the country
- Directly elected Mayor and Council
- Some degree of financial and local planning/investment autonomy

# National-Regional-Local: T, LU & E

Area of Intervention		Government Entity		
		National	Regional	Municipal
Transportation	Infrastructure Construction & Maintenance	MINVU (SERVIU) MOPTT		Municipalities
	Planning	MINVU, MOPTT SECTRA, MIDEPLAN	SEREMOPTT SERPLAC	Municipalities
	Operations	MOPTT, METRO, EFE	SEREMOPTT UOCT	Municipalities
Land Use	Planning	MINVU MIDEPLAN	SEREMINVU GoRe SERPLAC	Municipalities
	Development	SERVIU		Municipalities (Cordesán)
Environment	Planning	CONAMA	COREMA GoRe	
	Enforcement	CONAMA MOPTT, MINSALUD	COREMA	



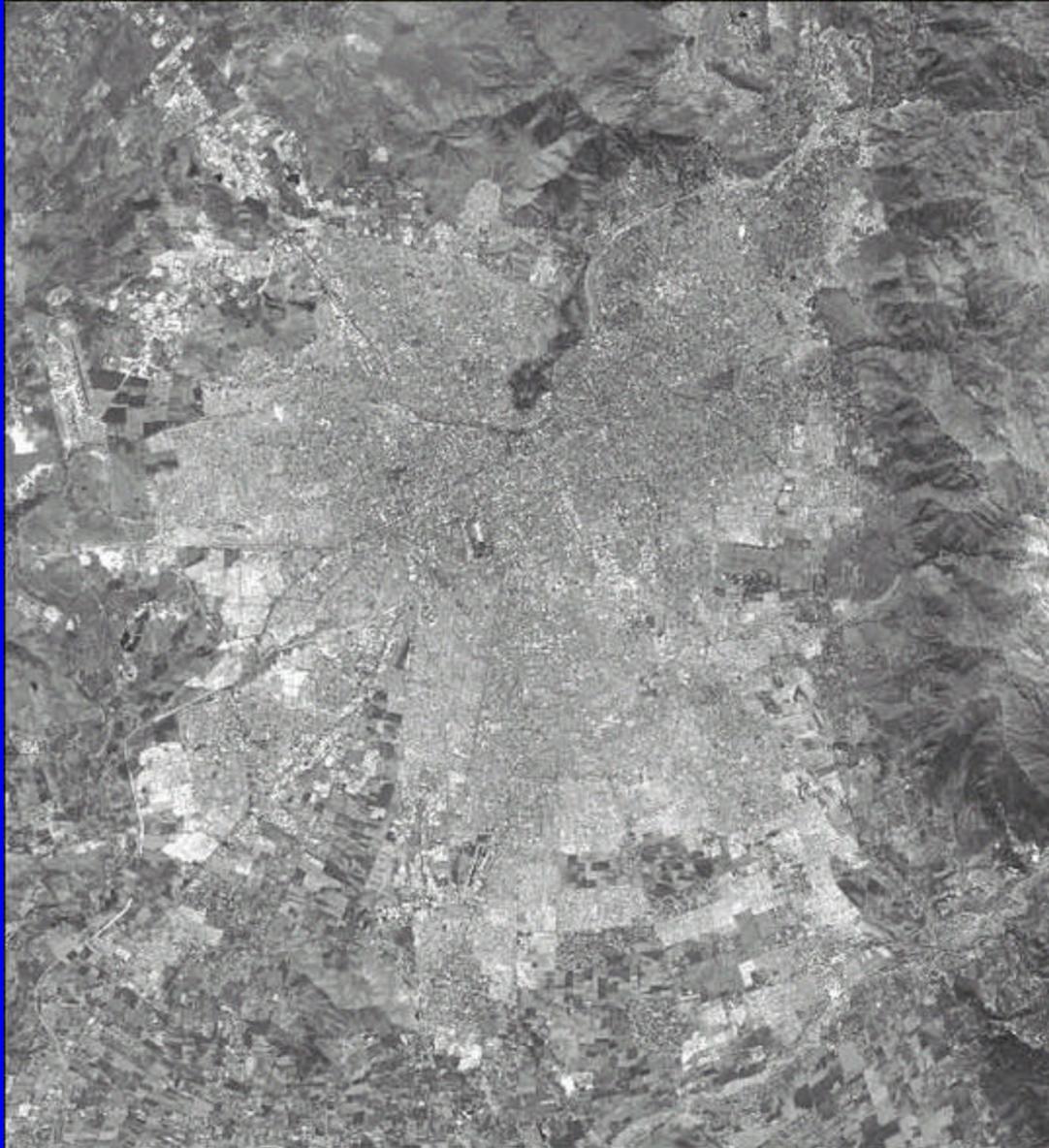
# The RM

- Six Provinces, 52 Municipalities
- Smallest of the nation's 13 regions in size, but home to 40% of population
- Province of Santiago (32 *comunas*), Greater Santiago (34 *comunas*), the SMA (?? *comunas*)
- 90% of RM population in the 34 *comunas* of Greater Santiago

# The RM Topography and Meteorology

- 2,800 km<sup>2</sup> Basin – 500 m above sea level
  - 80 kms N-S by 30 kms E-W
  - surrounded on E by the Andes (pre-cordillera peaks of 3,200 m), on W by Coastal Range (cordillera de la Costa with peaks of 2,000 m), with smaller ranges to the North and South
  - Mapocho River runs directly through Santiago, the Maipo runs just south of the SMA.
- Mediterranean Climate
  - Warm, dry, breezy in summer; cold winter, with infrequent storms.
- Thermal Inversion
  - Persists throughout the year
  - Exacerbated in fall and winter

# Topography of SMA



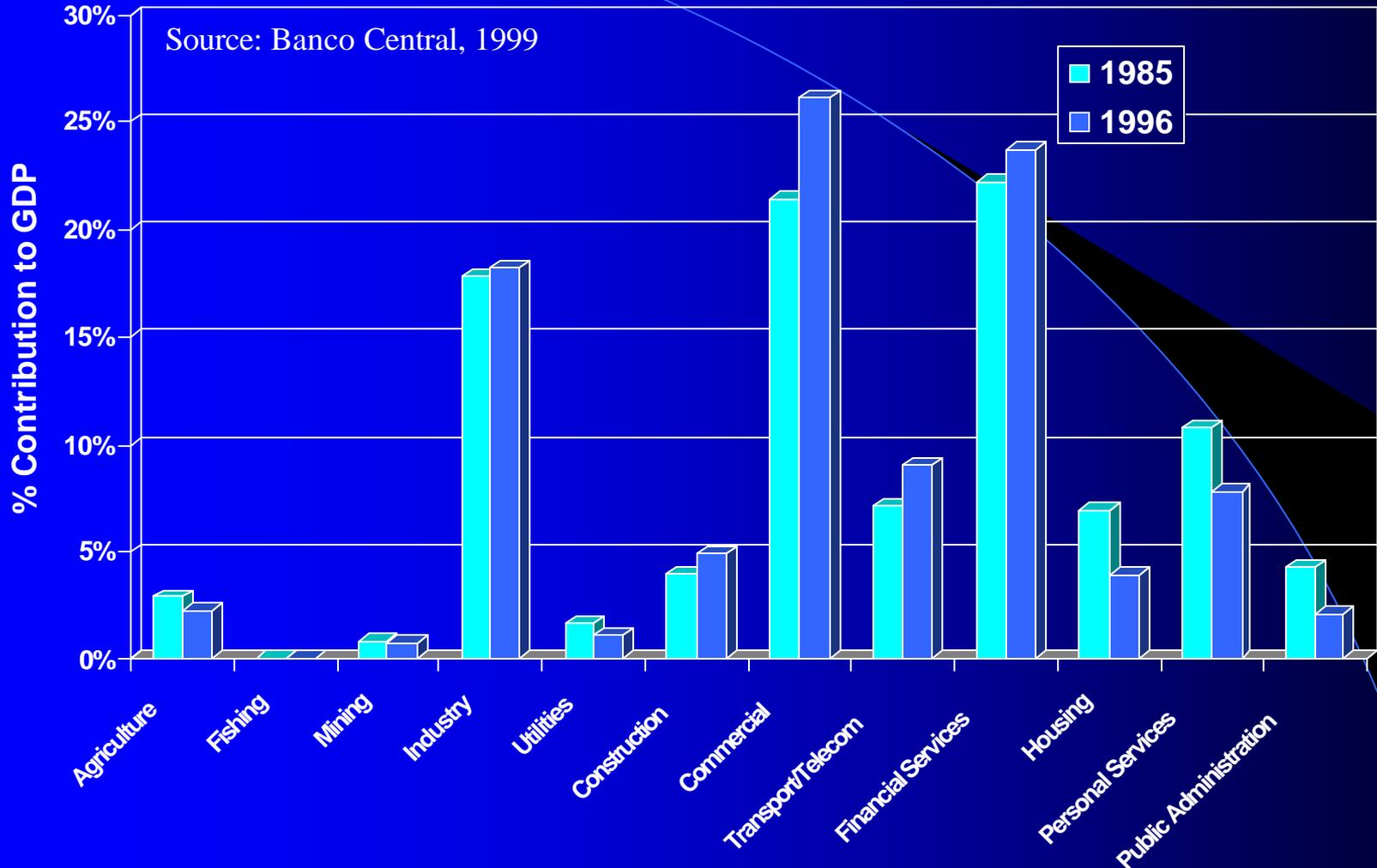
# Thermal Inversion



# Economy of the RM

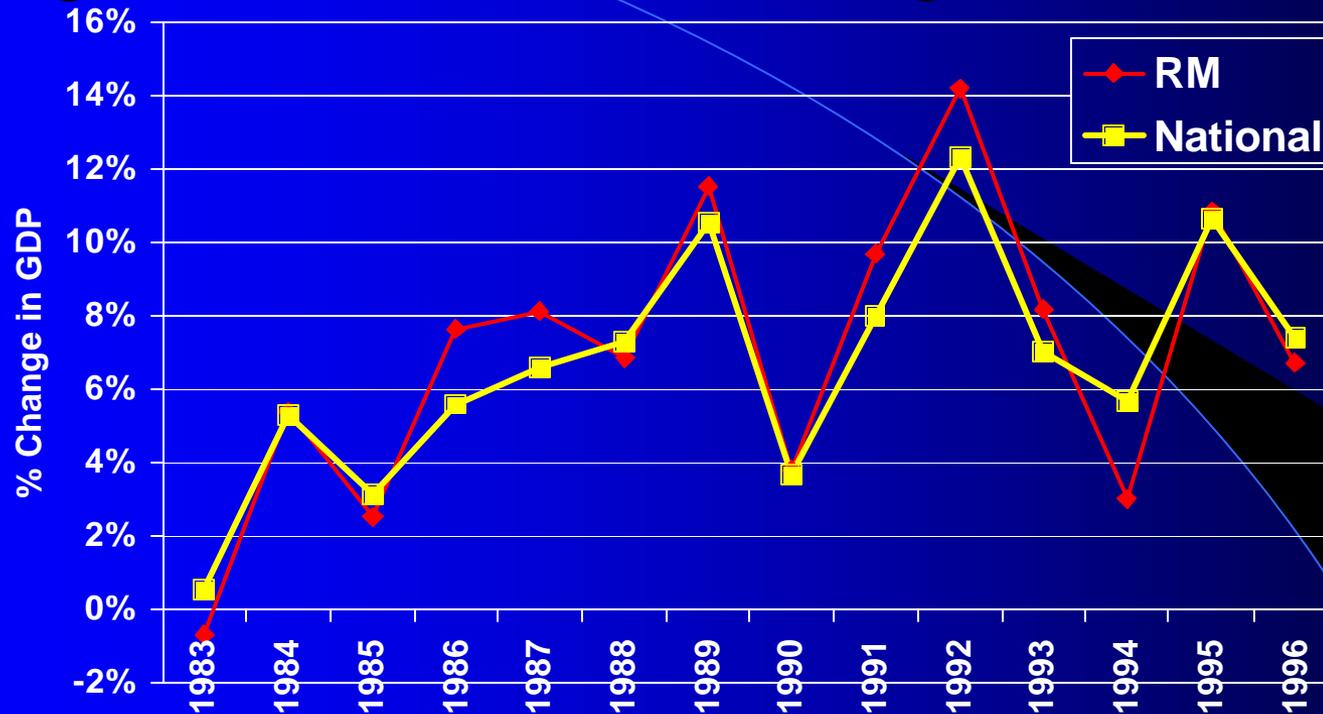
- Fundamental, continuously growing role in Chile's economy
  - Despite intentions over the years at decentralizing growth
- 1986-1996
  - RM economy AAGR: 7.9%; Nation: 6.8%
  - RM share of GDP: 42%  $\Rightarrow$  47%
  - RM share of industrial activity: 44%  $\Rightarrow$  52%
  - RM share of construction activity: 37%  $\Rightarrow$  41%
  - RM share of commercial activity: 65%  $\Rightarrow$  68%
- All banks and 46 of 47 of major economic groups HQ'ed in RM
- National center of education (universities)

# Composition of RM's Economy



Employment: Government/Social Services, 28% jobs;  
Industry, 23%; Commercial 20%

# As goes the Nation, so goes the RM....



Since 1997 Asian crisis, etc. has cooled the national economy:

- 97-98: 3.4%; 1998-1999: -1.4%; 2000: ~-5%

RM unemployment: 1995-98: 6.7%-7.5%; 1999-2000: 10%

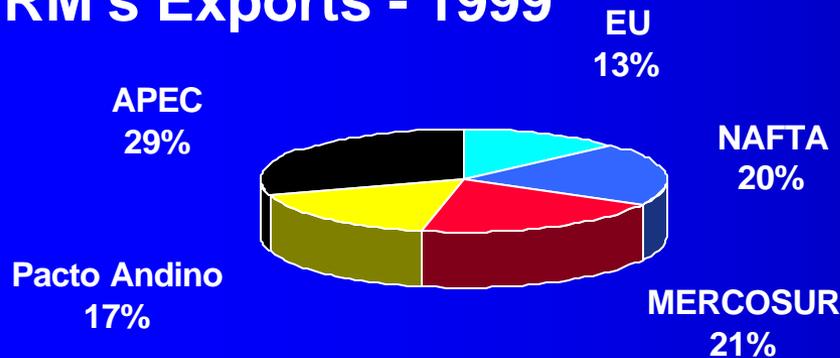
Greater Santiago unemployment: ~14% (2000)

# Economy and Globalization

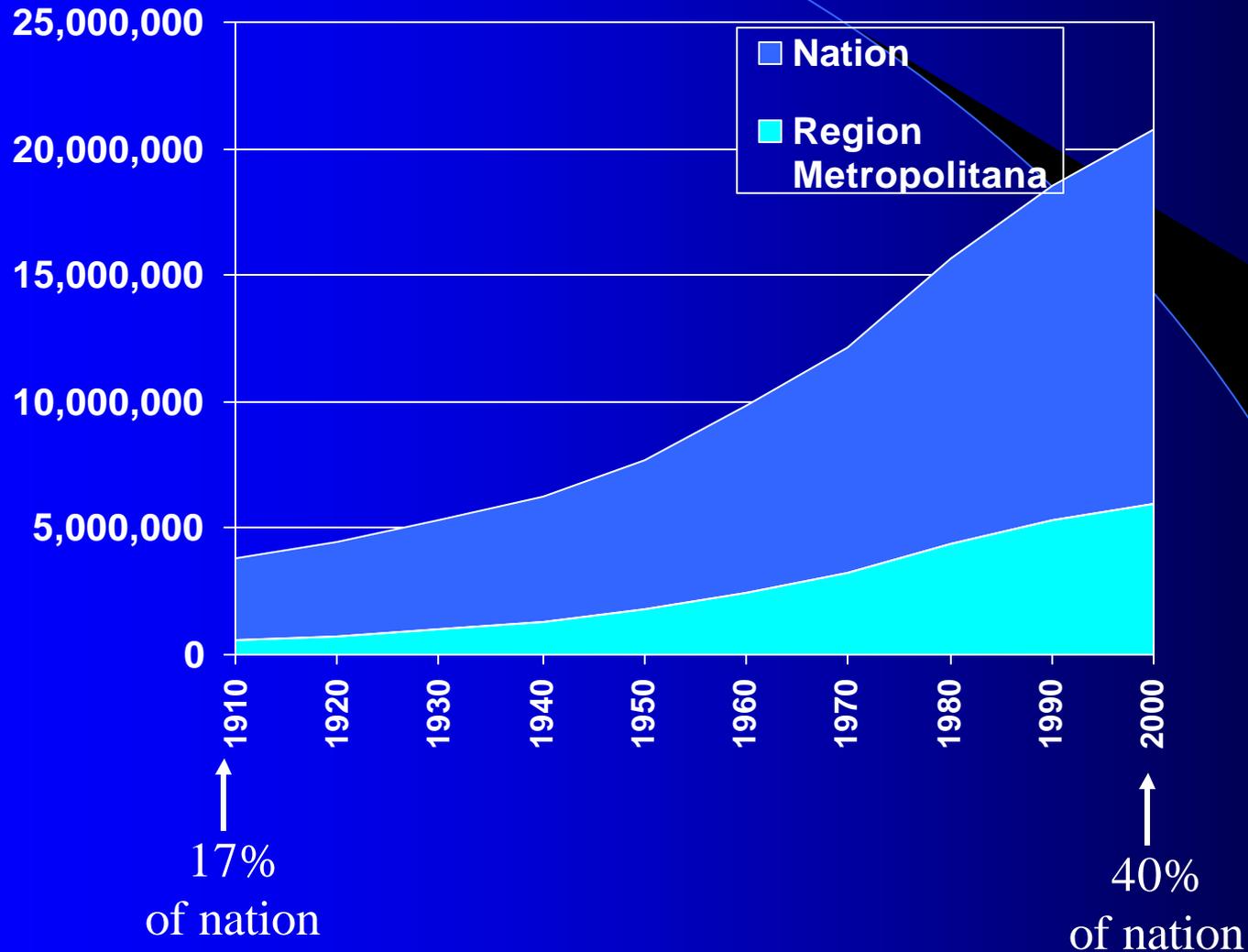
- Certainly important, but....
  - Exports account for just 13% of RM's GDP (vs. 30% for nation)



## RM's Exports - 1999



# RM Population Evolution



# Population Growth & Demographics

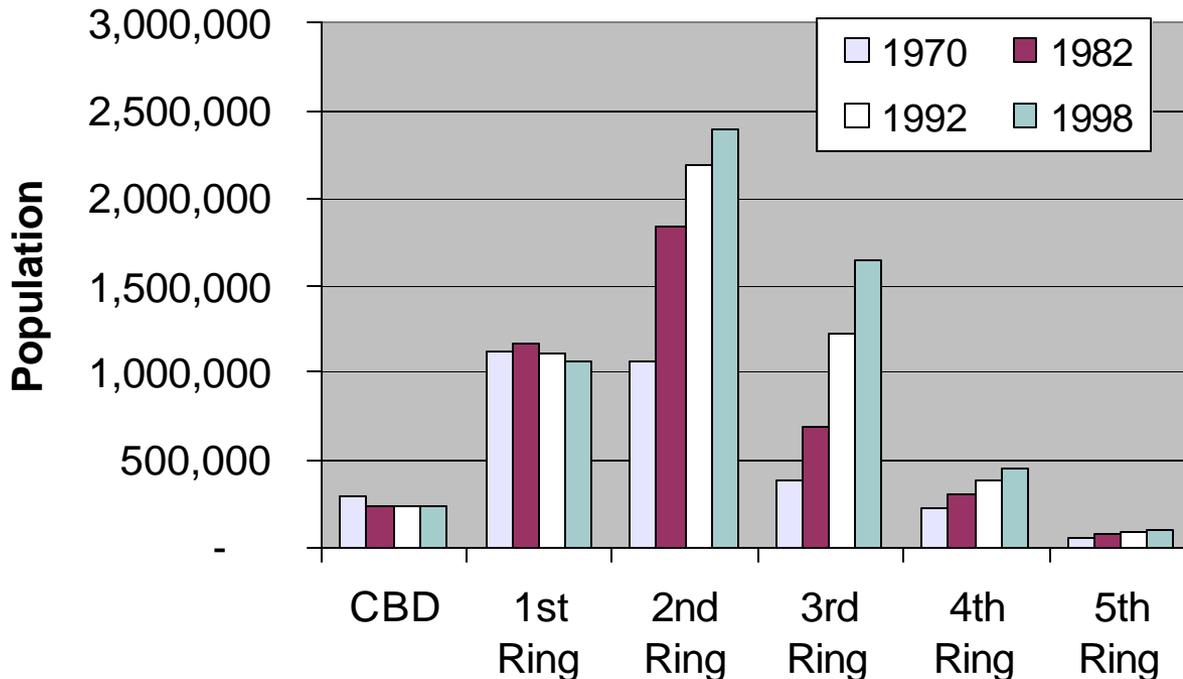
- Early 1900s: Santiago as nation's administrative center
- Mid 1940s: Import substitution policies led to industrial, financial commercial concentration in Santiago – trends that have continued...
- Recent Population Growth Trends (AAGR)

	RM	Nation
1970-1982	2.62%	2.03%
1982-1992	1.97%	1.64%

# Population: Regional Distribution

- 1970: 42% of RM's population concentrated in the comuna of Santiago and 10 directly adjacent comunas
- 1992: These same comunas account for 26% of RM's population
  - 3% population decline
- Major growth in West, South, Southeast

# Population Dynamics

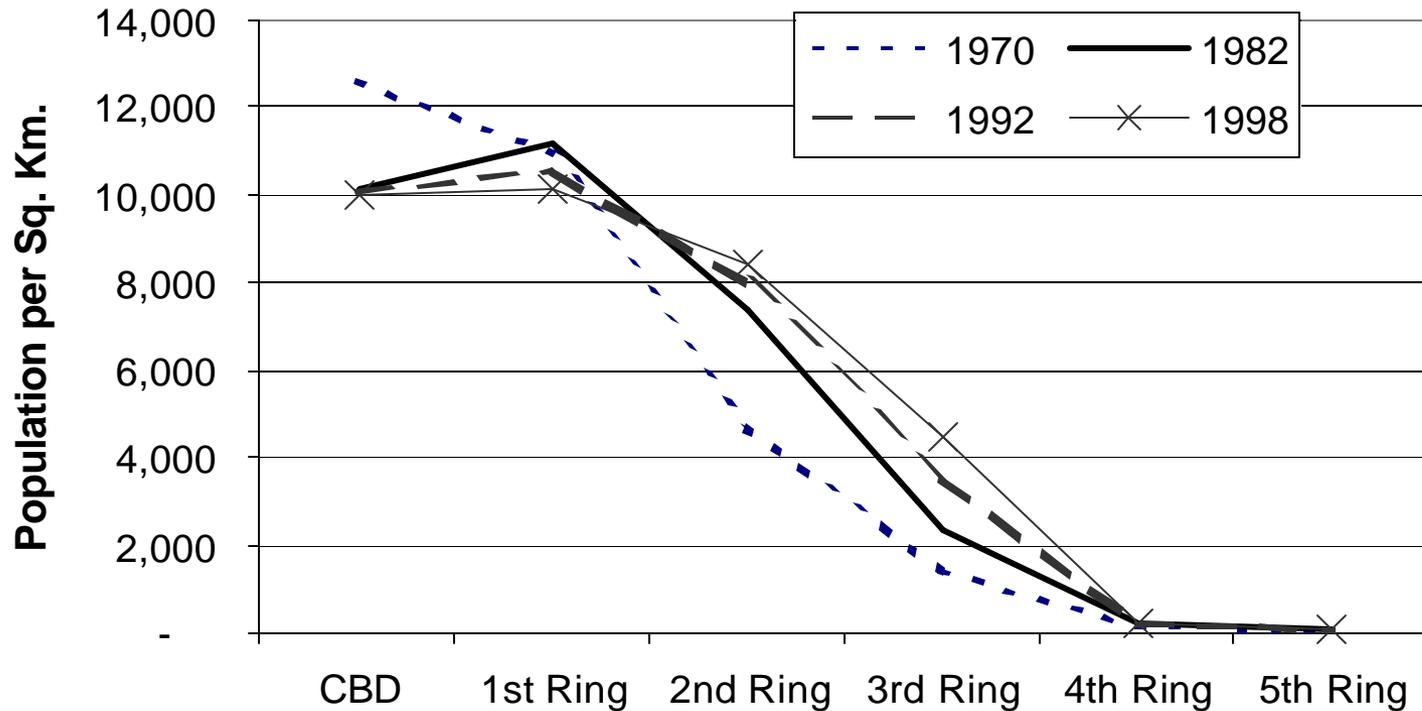


Note: Each ring is comprised of comunas within the following approximate radial distance from CBD (in km from rough geographic center of comuna) - 1st Ring, <5; 2nd Ring, 5<10; 3rd Ring, 10-15; 4th Ring, 25-45 ; 5th Ring, 50-100.

## Influencing Factors

- Low peripheral land prices (Public housing projects)
- Middle and Upper Income suburbanization
- Increasing commercial and service land uses in central areas

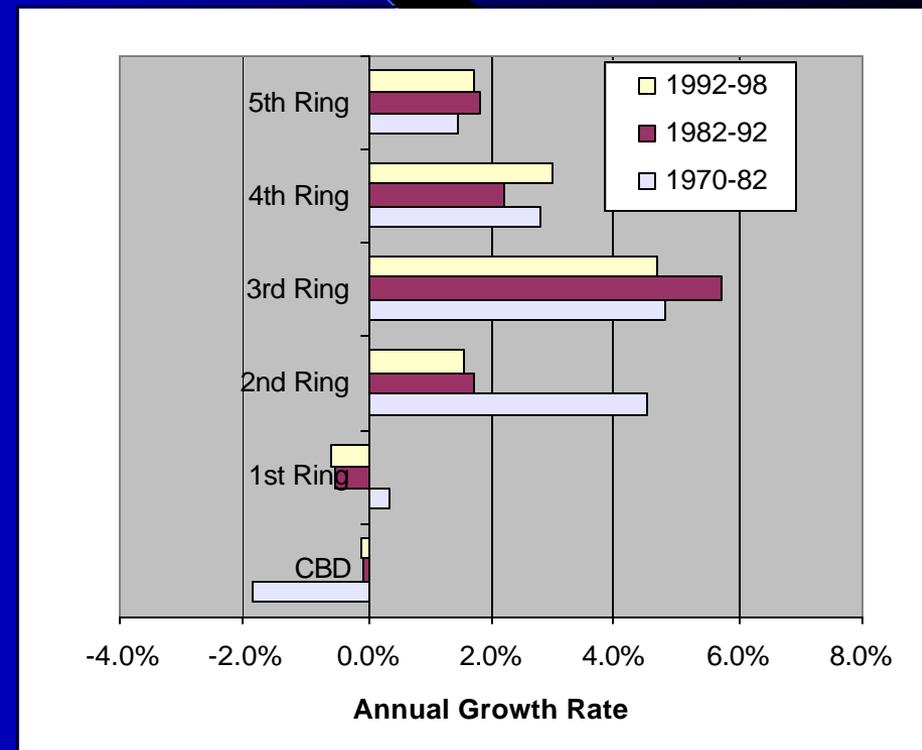
# Population Dynamics: Densities



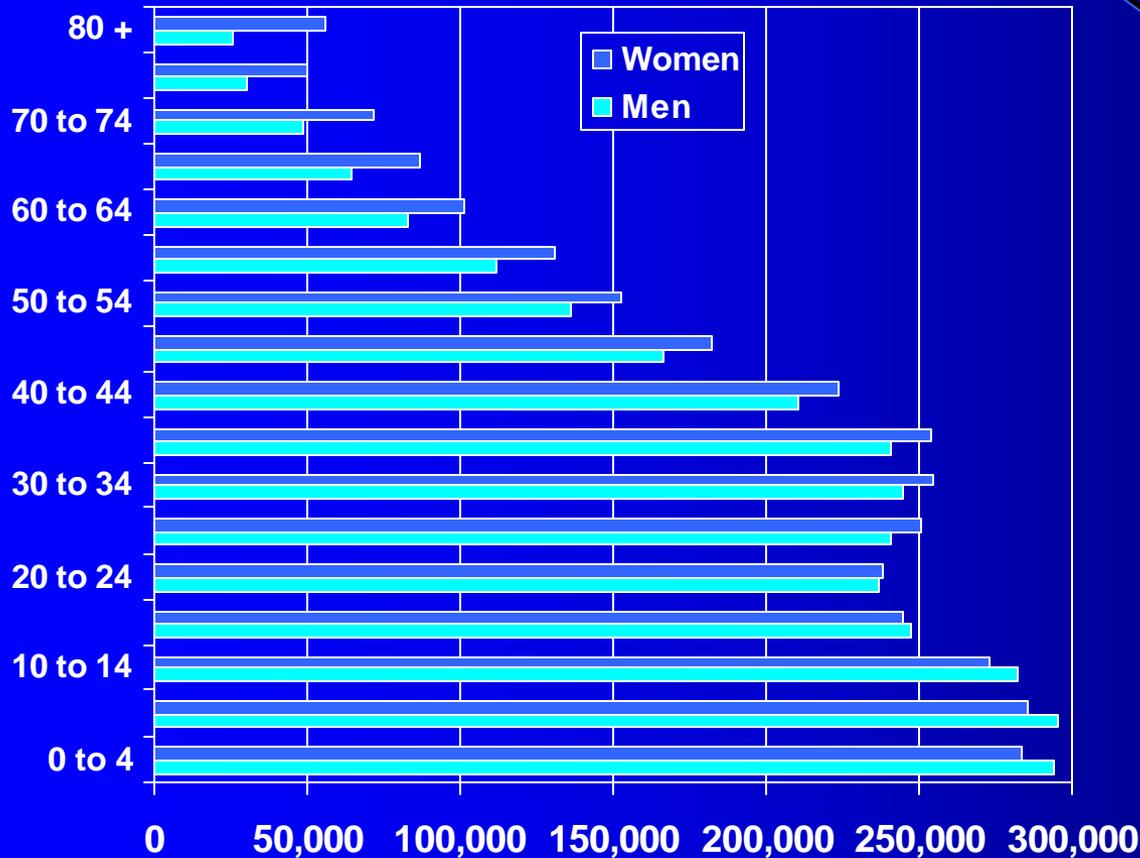
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# Population Dynamics – the Future?

- RM growth expected to continue to outpace nation
- By 2020
  - AAGR 1.75%: 8.8 million
  - AAGR 1%: 7.3 million
- Where will that population reside?
  - Will recent past growth trends hold true?



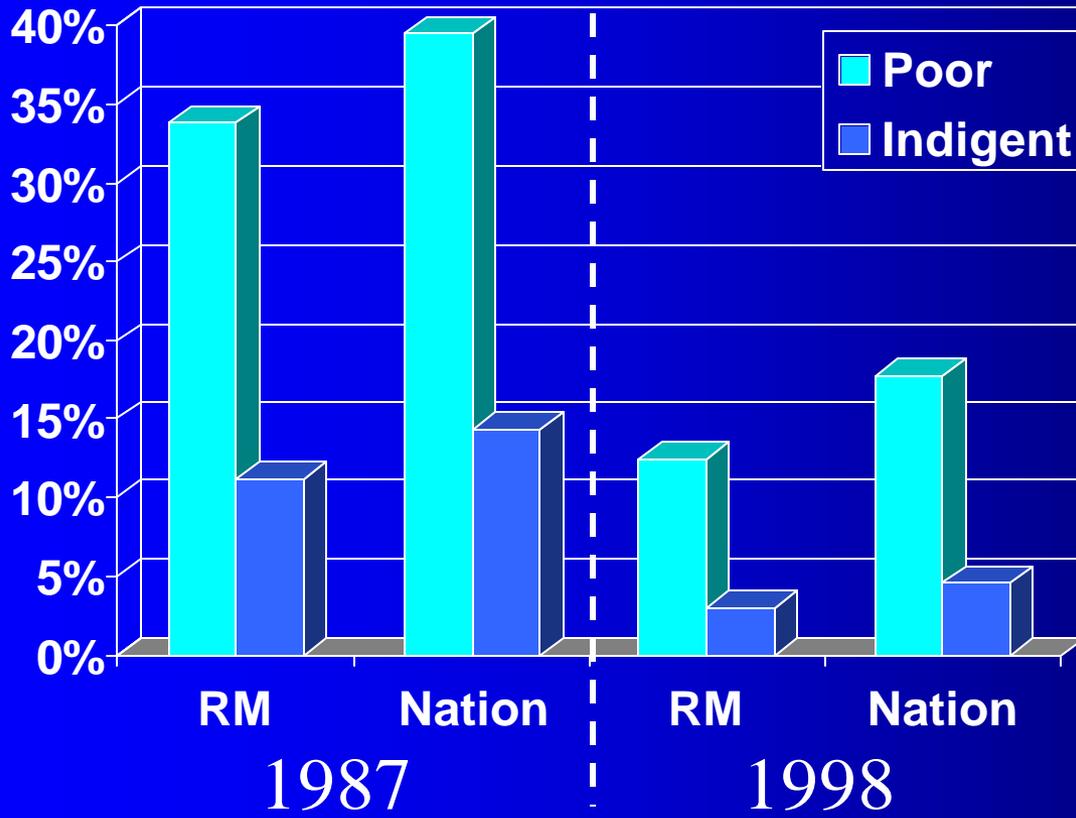
# Demographics: Ages & Households



## HH Size

- 1982: 4.82 persons  
– 3.5 to 5.7
- 1992: 4.25 persons  
– 3 to 4.8
- By 2010: 3.7

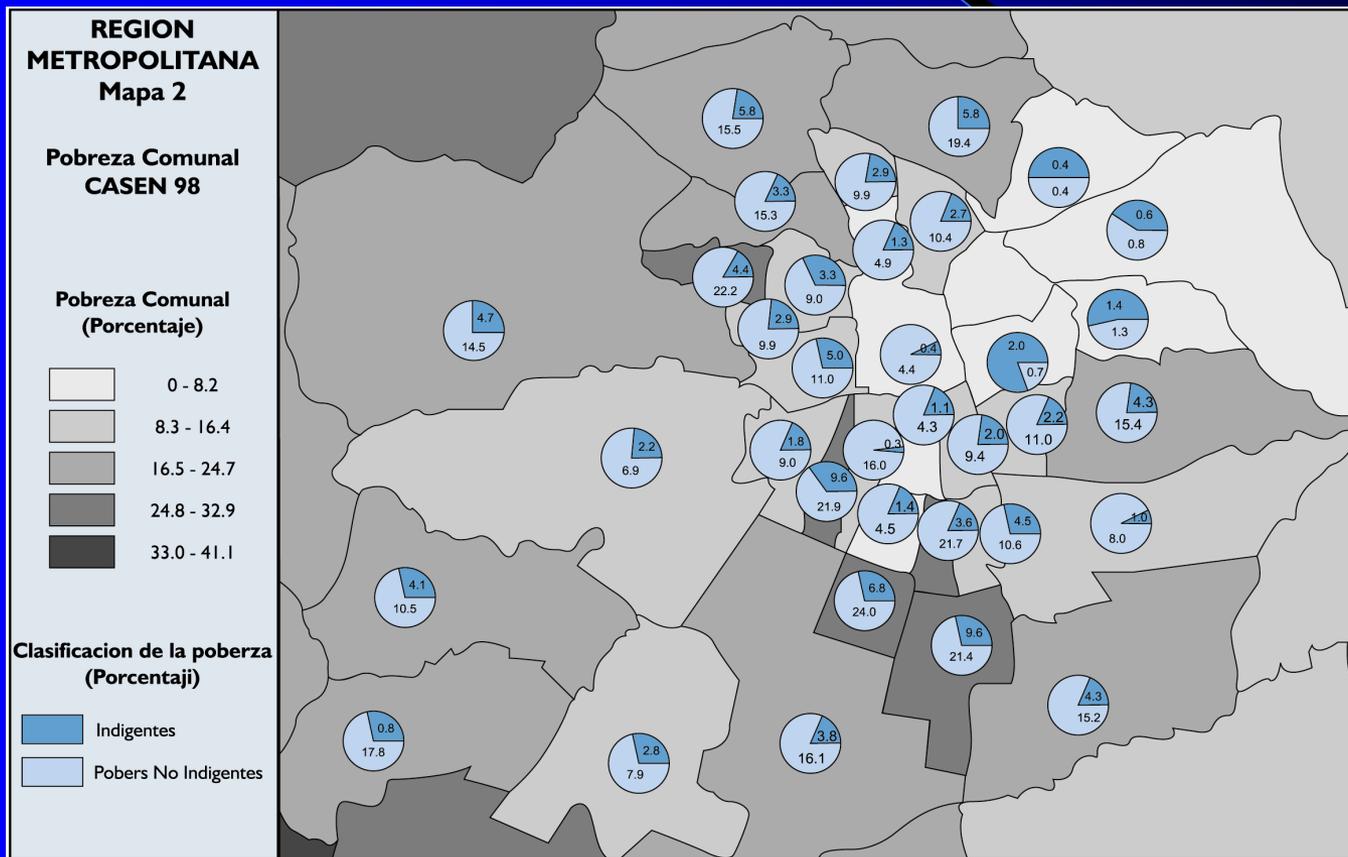
# Socioeconomic Characteristics



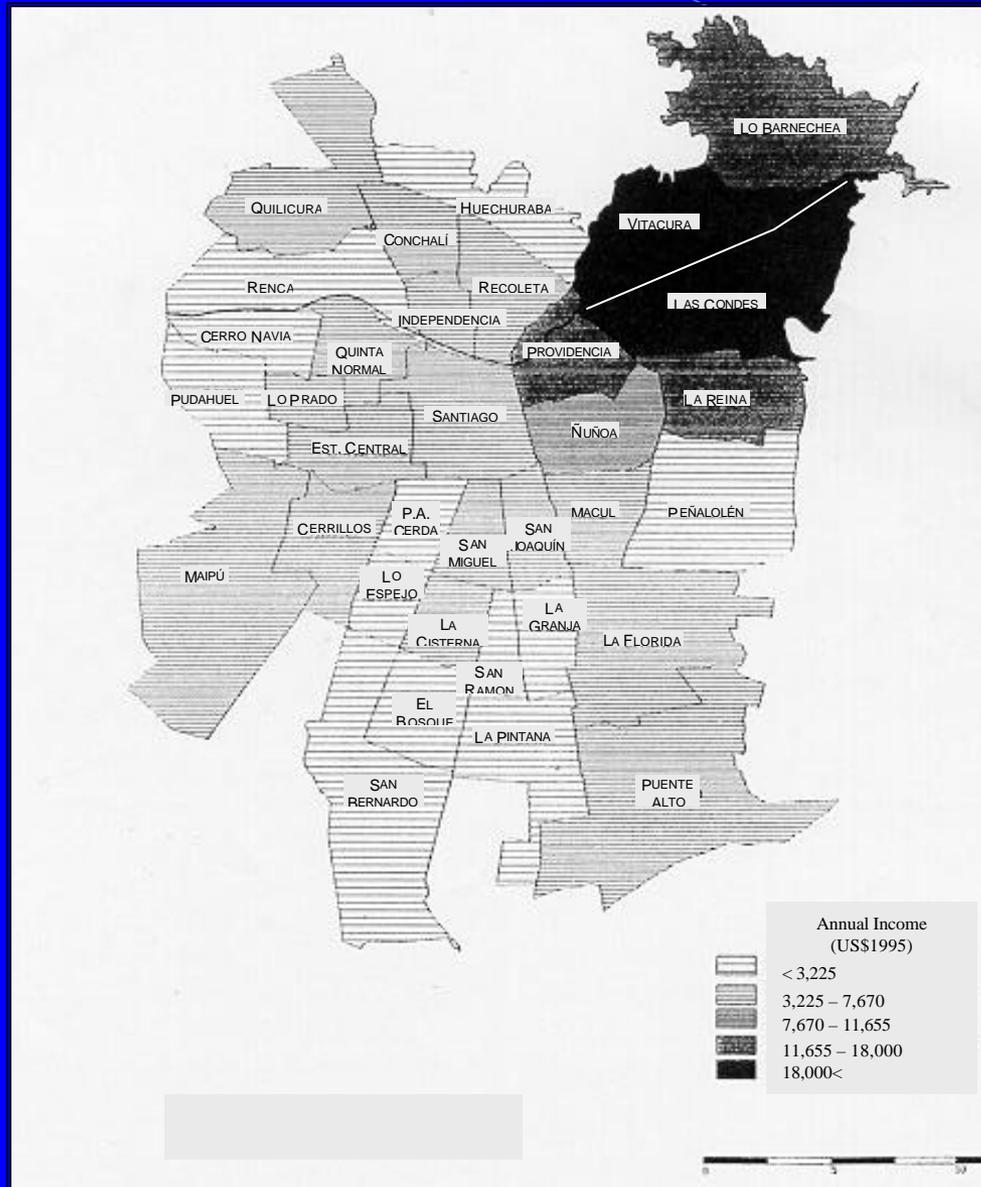
Indigent: Annual HH Income  
< \$500 (US\$1996)

Poor: Annual HH Income  
< \$1000 (US\$1996)

# The Segregated City-Region



# The Segregated City: “Cone of Wealth”



## Eastward Migration

- 75% of Greater Santiago's wealthiest residents reside in just 6 comunas
  - Las Condes, Vitacura, Providencia account for 54%
  - Low income “invasions” eliminated by govt. in 70s-80s
  - “Tiebout sorting”, plus comuna multiplying in 1981
- Middle classes more dispersed, but tend to follow rich...

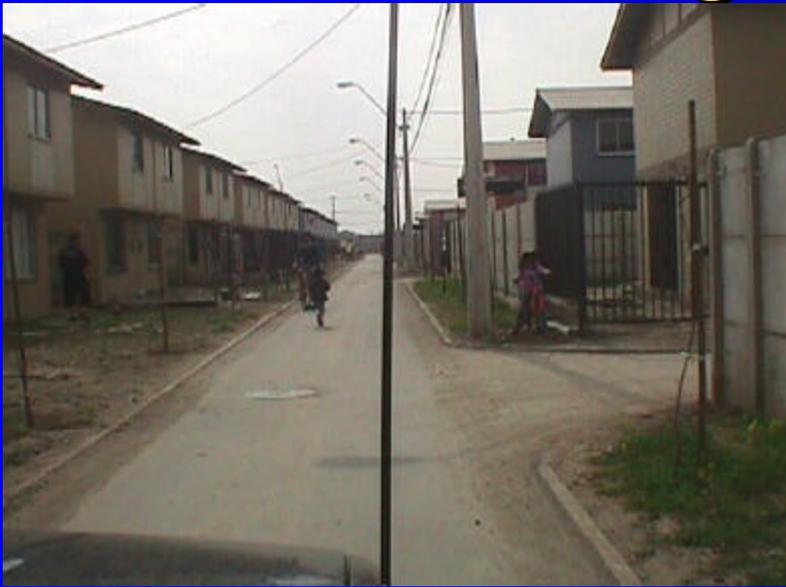
# The Segregated City

- Migration historically led to “invasions” and precarious housing
  - *Poblaciones > ciudades callampas > campamentos > “asentamientos precarios”*
  - Major efforts in recent years to supply public housing
- Segregation exhibited through inequalities in: housing quality, education, municipal infrastructure provision, greenspace, etc.

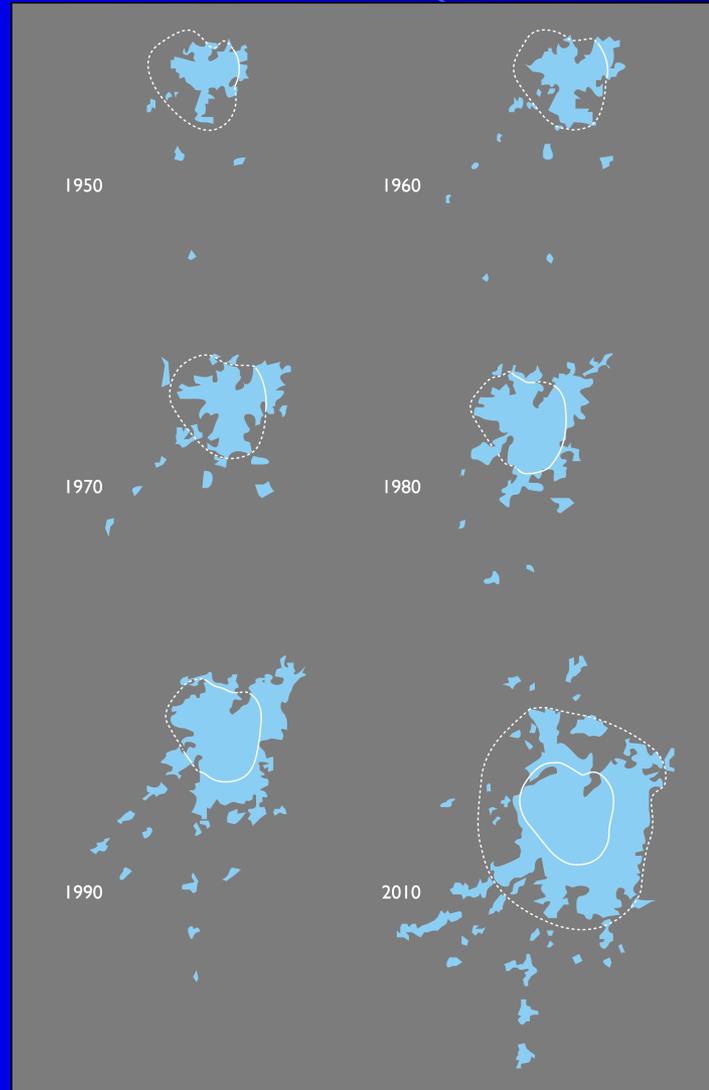
# The Segregated City



# The Segregated City



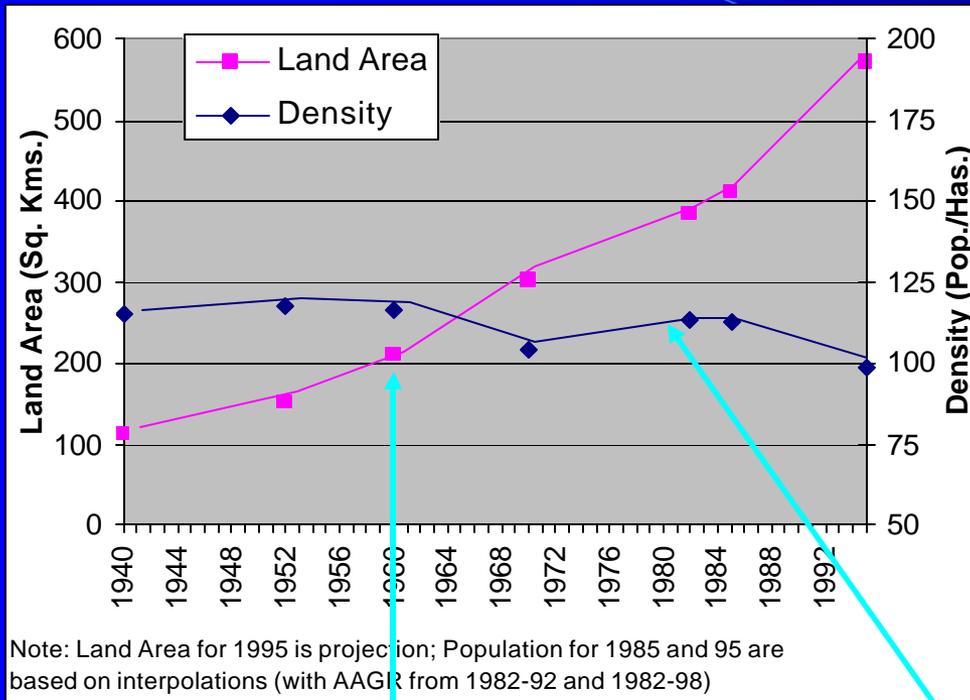
# Urban Expansion – the SMA



1940: 100 km<sup>2</sup>

1995: 600 km<sup>2</sup>

# Urban Expansion – Patterns, Influences



Overall Densities constant through 1950s

- though important shift in densities toward periphery

Densities decline during 1960s

By early 1970s, urbanization approaches growth boundary

- densities start rising

## First Metropolitan Land Use Regulatory Plan

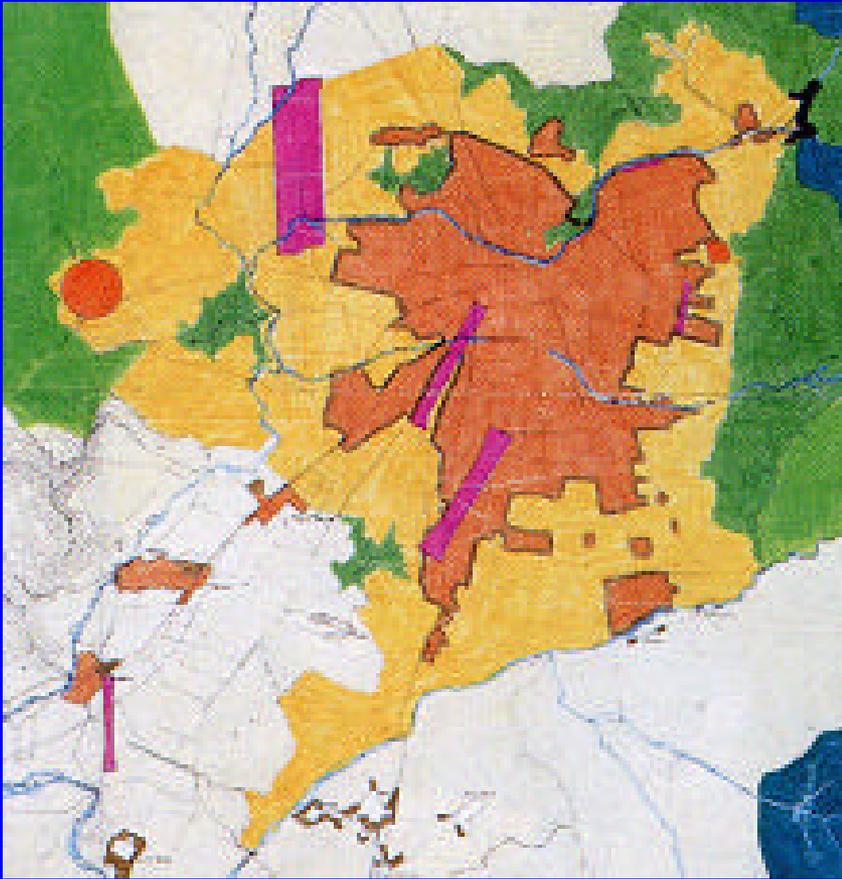
- includes urban growth boundary
- first major transport investments
- city begins losing “compact traits”

## Urban Growth Boundary Lifted

- after 1981-82 economic crisis city begins expanding 70% faster than population
- densities decline at most rapid rate in history

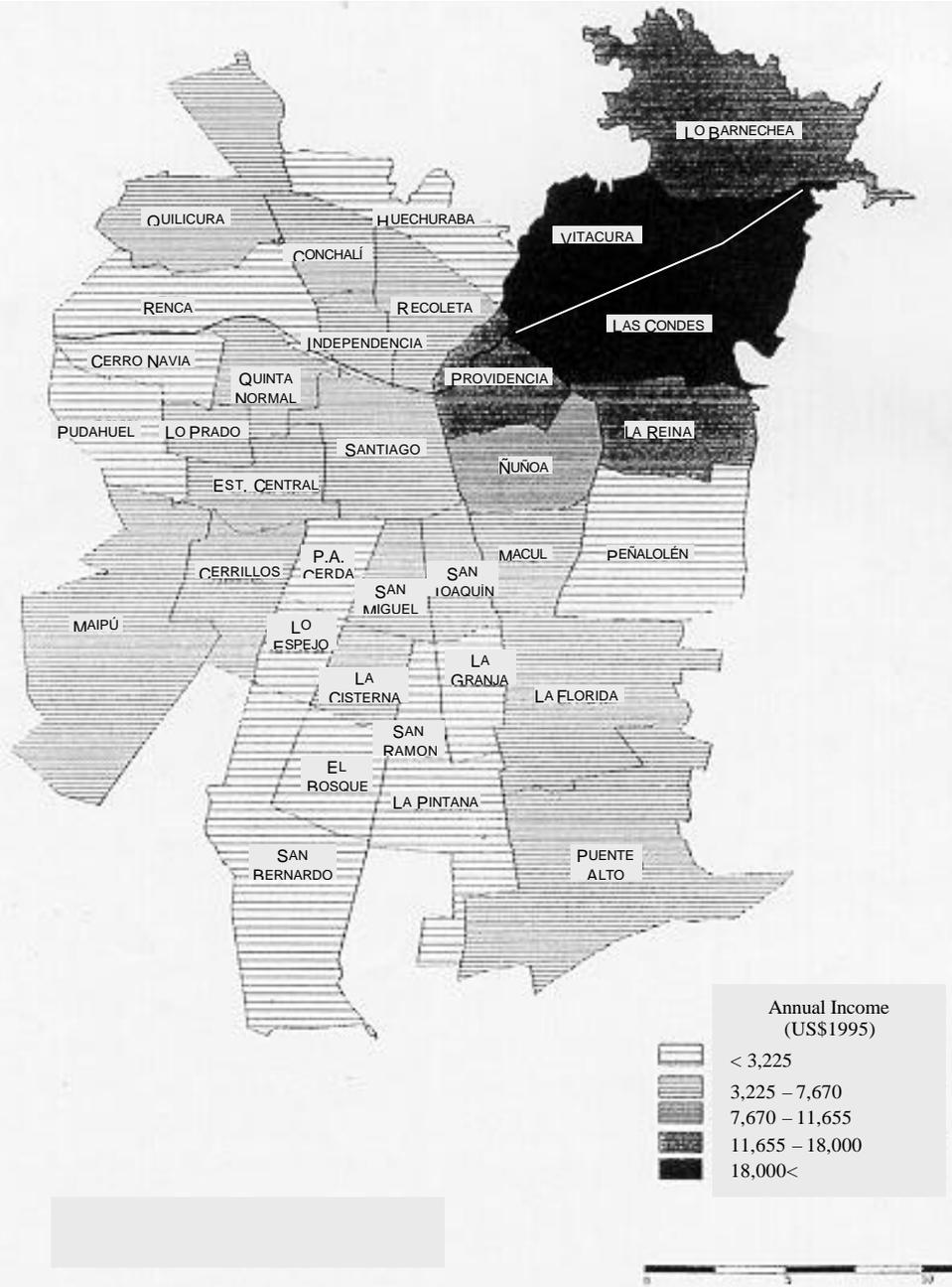
# Growth Patterns – Influencing Factors

## Lifting the Growth Boundary in 1979



## In More Recent Years

- Reinvigorated road construction
- Low density suburban subdivisions
- Distant public housing projects and “*invasiones*”
- Industries on southeastern & northern fringes and in West near Airport on Ring Road
- Demographics – middle class “boom”: From 1992-97, 60% of urbanization in 4 “middle class” *comunas*



# Urban Growth Forms

## The “Colonial city”

- Neighborhoods dating primarily to colonial Chile
  - Associated with old, historical city center and surrounding areas
- Spanish colonial quadrangular street grid, “Plaza de Armas”
  - Continuous façade buildings
  - Predominated through the 19<sup>th</sup> Century

# The Colonial City



Plaza de Armas

# The Colonial City



# The Colonial City



# Urban Growth Forms

## The “front yard” city

- First appears in late 19<sup>th</sup> Century
  - Desire to “privatize” space
  - Predominant form of city in first rapid wealthy eastward expansions
    - Agricultural subdivisions of today’s Providencia, Las Condes, Ñuñoa
- Highly profitable real estate model
- Continues today in megaprojects and individual subdivisions
- As much a status symbol as a residence

# The Front Yard City



# The Front Yard City



# The Front Yard City



# The Front Yard City



# Urban Growth Forms

## The “Park City”

- Multi-story apartment buildings
- Densely placed, surrounded by continuous greenspaces
- Latter half of 20<sup>th</sup> Century
- Densification of previous “front yard” neighborhoods
  - Lot consolidation and densification

# The Park City



# Urban Growth Forms

## The Marginal City

- Public housing, low income housing
- Dense, multi-story buildings
- Minimal amenities & related infrastructure
- Vast expanses on urban periphery

# The Marginal City



# An Emerging Urban Growth Form

## The “Renovated City”

- Product of government efforts to revitalize existing urban areas
  - Residential subsidies for apartment purchases in specified areas
  - Since 1990
  - (more details in next week’s lecture)

# The Renovated City



# Urban Growth Forms

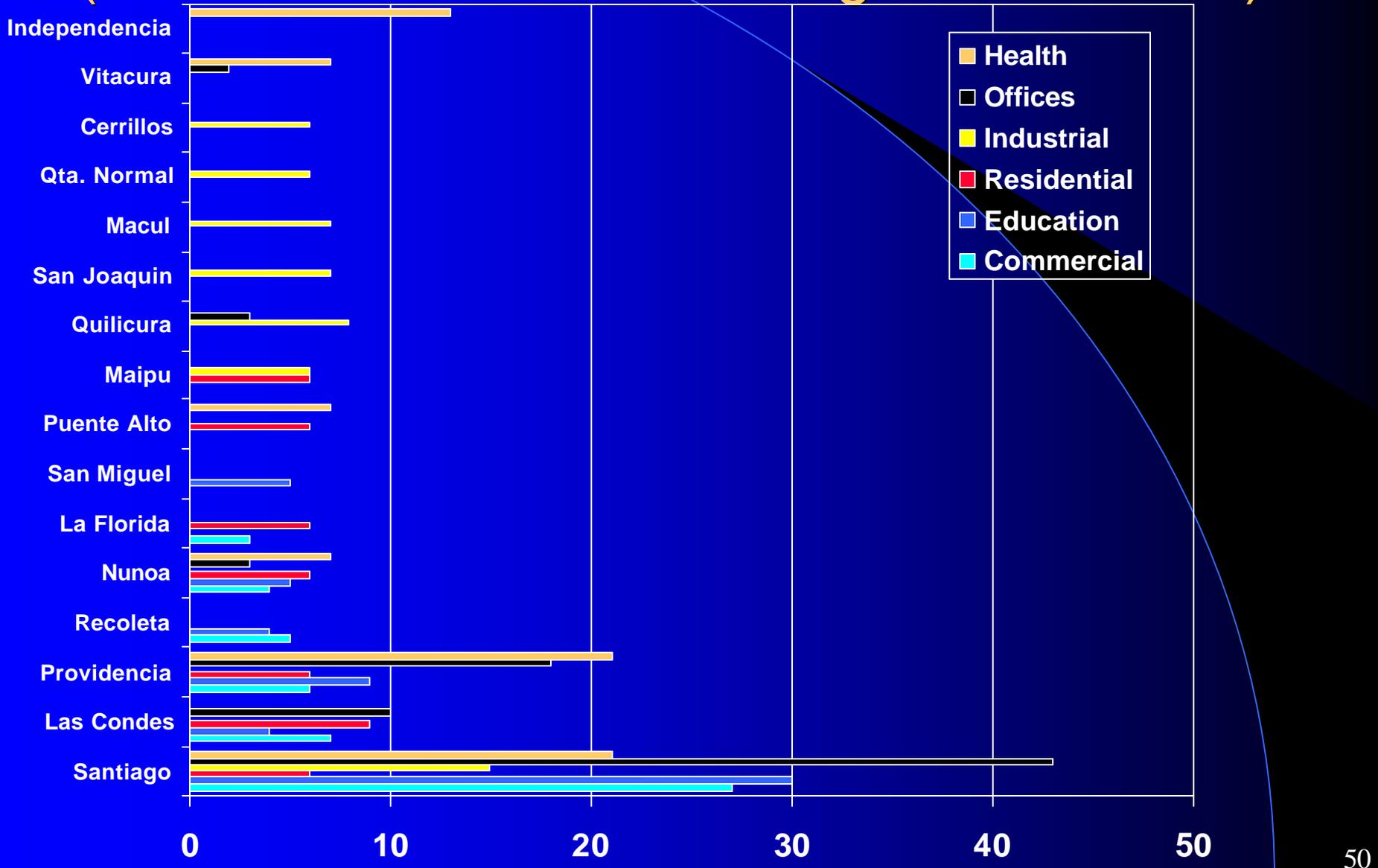
- The Colonial City
  - No longer being developed, has left no legacy influencing today's urban developments
    - i.e., no “neo-colonial” development – narrow street networks, diverse building facades, mixed uses, public spaces
- The Park City and Front Yard City
  - Design preferences, socio-economic choices
- The Marginal City
  - Response to immediate needs and conditions of poor
- The Renovated City
  - Direct public policy influence on consumer preferences
- Influencing factors in each: public investments, norms & plans in time, real estate market and its evolution (more next week).

# Land Uses

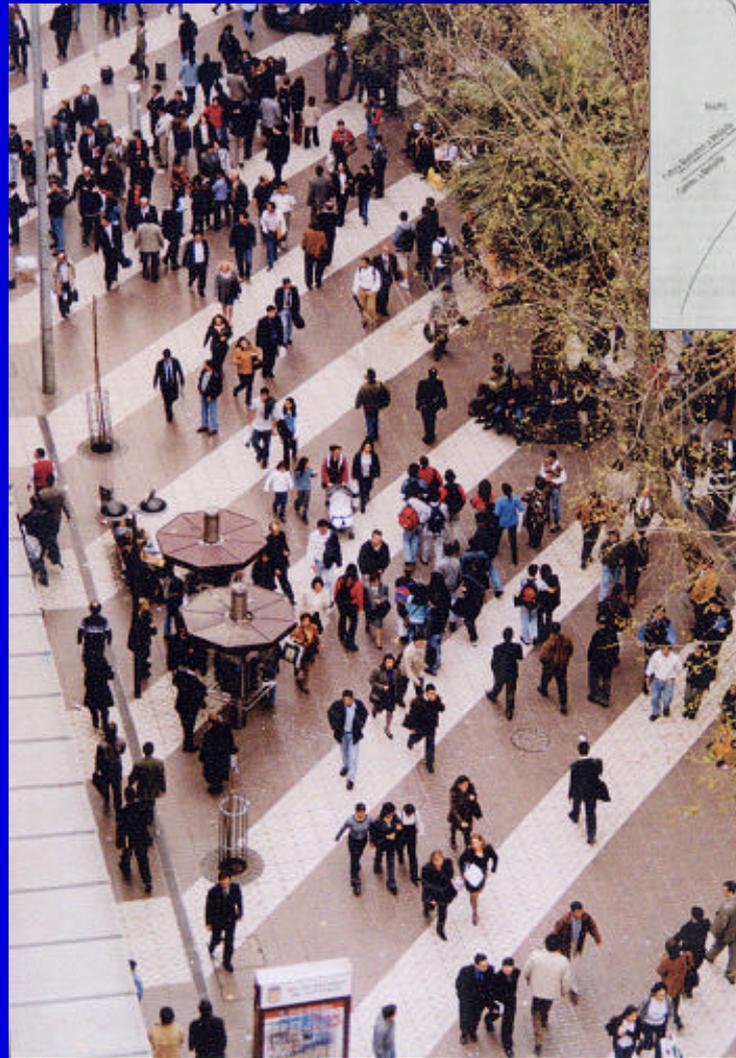
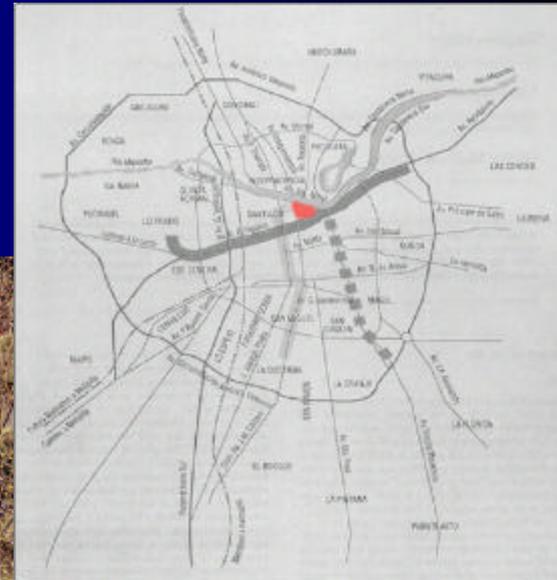
- Despite expansion, non-residential land uses remain highly concentrated
  - *Comuna* of Santiago (CBD) accounts for 27% of Greater Santiago's commercial land uses, 30% of educational land uses, 43% of office space, 21% of health facilities, 15% of industrial land

# Land Uses

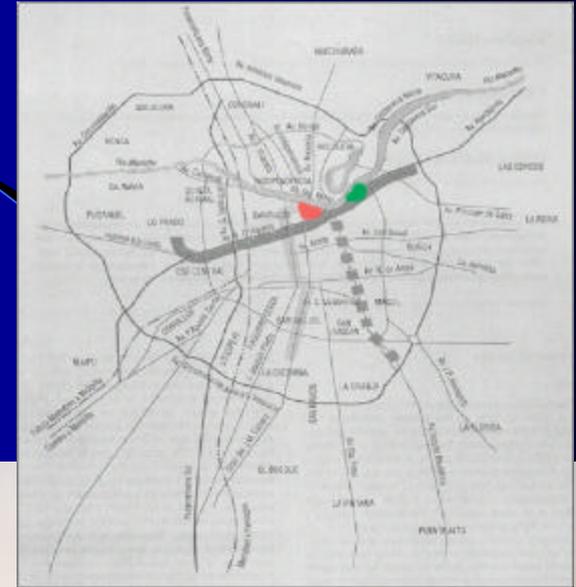
(% share of Greater Santiago's Land Use)



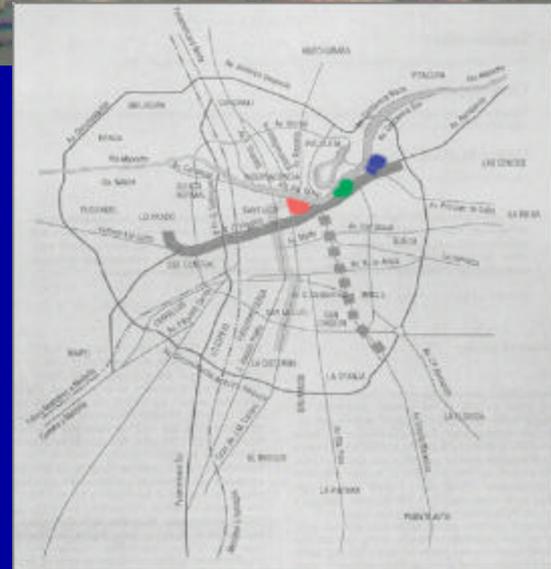
# Santiago's CBD



# The CBD Moves East - Providencia



# The CBD Moves East – Las Condes



# Future “Non-C”BDs



# Transport System: Brief History

- Horse trams and steam trains (to San Bernardo and Puente Alto) by turn of Century
- By 1930s, city has one of most extensive electric tram networks in South America
  - 220 kms, 210 passengers/year
  - Dismantling begun in 1945
- By 1960s (first land regulatory plan)
  - Plans also laid for Metro system
  - Construction begun on ring road (Vespucio), Avenida Kennedy (East to Las Condes) and the PanAmerican Highway



# Next Time

- Transportation - Continued
- Environment
- Instruments, Interventions to date
- The Real Estate Market