Although the overall population is not expected to increase significantly, demographic changes and increasing incomes will increase housing demand in particular sub-markets.

- The mobile population may create a market for small, easily salable units.

- Aging population will drive market towards new typologies and amenities for seniors.

- Increasing childbearing age and life expectancy will result in larger units or diversified configurations.

The maturation of the private housing market and the overall economy will make branding strategies crucially important to residential development.
Nearly a quarter of Shanghai’s population is “mobile.” Less than 5% of this population currently owns a home, but this group might comprise a market for small units in flexible markets.

The Aging Population

- Huge increase in life expectancy
- China has the fastest-aging population in the world.

Age distribution in Shanghai 2003

- 76.3%
- 11.5%
- 12.2%

Opportunities:
- New housing products for the elderly
- Adjacencies between smaller and larger units allow adults to care for aging parents.
- Senior homes
- Ground floor development
- Handicapped access
- Medical care facilities

Photo: google images
Sources: Economist Intelligence Unit, Asian Insights Marketing Ltd.
www.cia.gov
Low birthrate and delayed childbearing age

- Small increase in women of child bearing age
- Decrease in propensity to have children
- Child households predicted to decrease from 51% in 2001 to 38% by 2011

Countertrends?

- End of One Child Policy
- Decreasing female labor participation

Sources: Economist Intelligence Unit Asian Insights Marketing Ltd.
The combination of the aging population and increasing childbearing age may increase the number of families caring for both children and parents at the same time.

Over 40% of American women will be the primary caregiver for BOTH a child and a parent at the same time at some point in their lives.

Although there were many predictions that modernization would lead to a breakdown in Asian family structure, the portion of elderly living with their children has stabilized at about **54% in Japan** and **67% in Korea**.

Source: The RAND Corporation, “Aging in America”
Housing space

Family size

the government goal for living space per person is 32 m^2 by 2020, tripling unit size from 2000

Sources: People’s Daily 04/25/2001 (China)
People’s Daily 04/13/2004 (China)
Asian Insights Marketing Ltd.
• As the secondary market for housing competes with new development, new development must differentiate itself.

• Maturity in the economy and the housing market have led US developers to focus on branding.
Water and Waste

- To ensure better water quality and protect the local ecology, large scale developments will be seeking available alternatives to local ground water.

- Continued rise in domestic sanitary and storm waste has outpaced the treatment capacity. Large new developments may be encouraged to take on more of this responsibility on site.
Shanghai ground water resources are low, & surface water from river systems is often low quality.

Per capita fresh water resources (cubic meters)

Woe of Shanghai's water sources
Shanghai Star. 2005-06-09
Shanghai Fresh Water Supply

- **Surface water**
  - Industrial wastes

- **Ground water**
  - Subsidence

Pre-1950: 30% Surface water, 70% Ground water
Present: 70% Surface water, 30% Ground water

SOURCE: (Zhou and He, 1998)
- New development may need to seek alternative sources and protect surrounding surface water.
  - Exploit rainfall Shanghai has high rain fall which coincides with peak demand
  - Desalinization
    - Protect local existing surface water
    - Buffer zones at waterways
    - Split sources from two water systems

Source: (Zhou and He, 1998)
Municipal Waste

1991

Treated
13%

Non-Treated
87%

2001

8%/yr Growth In Domestic Output

50%

- Shanghai expanded municipal waste treatment rates dramatically but untreated domestic waste output growth still higher due overall growth

Source: Shanghai environmental bulletin 1991 and 2001
Communities may increase responsibility for their own waste.
- Local reduction of effluent output
- Local treatment / reuse of grey-water component
- Local retention of storm component

Source: Shanghai environmental bulletin 1991 and 2001
Energy

- In order to avoid power shortages and allow growth, new development districts may consider developing diversified energy strategies.

- New infrastructure will enable cleaner fossil fuels may enable decentralized power generation at the district level.

- Large developments may consider reducing their demand by developing local sources and load shifting methods.
Increasing Electrical Demand

Per capita energy consumption and emission of CO2 comparing cities and provinces in China

- Use of residential air conditioning increase
- Growth in other residential appliances
- Longer appliance usage trends

SOURCE: A Tale of Five Cities: The China Residential Energy Consumption Survey; Debbie Brockett, LBNL; David Fridley, LBNL; Jieming Lin, LBNL; Jiang Lin, LBNL
Energy Sources Over Time

1985 2005 2020

Coal
Oil
NG
Hydro
Nuclear
Wind / Solar / Geo

4.3% Growth Through 2025

Liquid Natural Gas Increase
Hydro Increase
Nuclear

- As infrastructure improves, natural gas will allow localized co-generation and alleviate peak load and transmission problems
- Developers to team up with utility providers in face of shortages in Shanghai area

Source: “Expanding Natural Gas Use in China”

Dong Xiucheng
University of Petroleum, Beijing
Pacific Northwest National Laboratory
Jeffreylogan@pnl.gov
• Load Shifting and Demand Side Management already beginning in Shanghai and Jiangsu provinces, next step will be at district scale

• Districts may pursue local generation supplement
  • Solar Thermal/ Photovoltaic
  • Geothermal heating and cooling

SOURCE: “China/US energy alliance report” by Bryant Tong & Bob Epstein
Transportation

Implications of growth:

1. Innovative parking solutions: underground parking, tandem parking.
2. Adopt road infrastructure for increasing use: Wide roads, clear points of access.

Implications of Alternative Strategies:

1. Locate housing near and with access to public transit: establish private shuttle system or public/private partnerships, create bicycle and pedestrian friendly routes.
2. Consider alternatives to typical private ownership: Zipcar model, small cars, new technology.

Source: Statistics Bureau of China
China’s vehicle ownership is on an upward trend and has far to go before catching up with smaller, less populated countries.

Private Vehicle Ownership

Sources: Department for Transport, Great Britain; Taiwan Institute of Transportation; Singapore Department of Statistics; National Bureau of Statistics, China; and Japanese Ministry of Internal Affairs and Information, Statistics Bureau
China still has a strikingly low percentage of vehicle ownership.

Sources: Department for Transport, Great Britain; Taiwan Institute of Transportation; Singapore Department of Statistics; National Bureau of Statistics, China; and Japanese Ministry of Internal Affairs and Information, Statistics Bureau
The Question: Will Chinese car ownership quadruple by 2020 as predicted? (to 56 mill cars)

- Vehicles as status symbols
- Increasing GDP leads to increased ability to purchase cars
- Improved road infrastructure can accommodate more vehicles
- Two-child allowance will increase younger population
- Government promoting expansion of auto industry
- Privatization of housing led to longer home to work commutes
- Impending fuel tax/car tax
- Registration auction and cap reduces overall number of cars
- Cost of car ownership still very high for average income
- Limited parking in China results in high prices
- Congestion – inadequate road infrastructure

Source: Solutions: Transportation in Developing Countries
The cost of owning a car in Shanghai will limit the growth of vehicle ownership.

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<tbody>
<tr>
<td>Driveshool</td>
<td>$500</td>
<td>Small, domestically sedan</td>
<td>10,000</td>
</tr>
<tr>
<td>10% Tax and registration fee</td>
<td>3,500</td>
<td>Total (due in cash, up front)</td>
<td>$14,000*</td>
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<tr>
<td>Shanghai average income</td>
<td>$2,148 (2004)</td>
<td>vs. USA yearly cost:</td>
<td>$8,431**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>vs. USA avg. income:</td>
<td>$60,070</td>
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*Does not include fuel, impending vehicle tax, parking costs
**Includes fuel, average parking costs, and an average $741 in financing costs

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<th>Yearly cost (1st year)</th>
<th>Mean Income (per household)</th>
<th>% income required to purchase car</th>
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<tbody>
<tr>
<td>Shanghai</td>
<td>$14,000</td>
<td>$2,148</td>
<td>186%</td>
</tr>
<tr>
<td>USA</td>
<td>$8,431</td>
<td>$60,070</td>
<td>14%</td>
</tr>
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SHANGHAI: Current shortage: **60,000** spots
Estimated shortage 2010: **120,000** spots

Sources: Solutions: Transportation in Developing Countries, National Bureau of Statistics, Park24 Co. Ltd., China Internet Information Center
The expansion of the Shanghai subway system will support alternative commuting strategies.

82km
Shanghai Now

London, England: 415km
New York, USA: 368km
Tokyo, Japan: 296km
Singapore, Singapore: 109km
Taipei, Taiwan: 66.2km

Shanghai bus system is largest in China. 2020 Prediction: Ridership will double

Sources: UrbanRail.net, Subway’s Future, Solutions: Transportation in Developing Countries, Greenhouse Gas Scenarios for Shanghai, China