TRAFFIC IMPACT ASSESSMENT

Methodology

Background

Projection

This analysis of transport network is based on choices of working population in Yuen Long in 2016.

Trip Distribution

A trend analysis reveals that future infrastructures and development are taken into consideration.

Traffic Impact Assessment

Trip Assignment

Internal Network - Highway

MTR AM Peak Hour Occupancy Rate

Railway Usage

- West Rail Line
  - Capacity: 26200
  - To Hung Hom
    - Density: 6ppm
  - To Tuen Mun South
    - Density: 4ppm

- East Rail Line
  - Capacity: 56200
  - To Hung Hom
    - Density: 6ppm
  - To Tuen Mun South
    - Density: 4ppm

- KCR AM Peak Hour Occupancy Rate
  - To Hong Kong City
    - Density: 6ppm
  - To Tai Po
    - Density: 6ppm

- Hong Kong MTR
  - AM Peak Hour Occupancy Rate
    - To Kowloon
      - Density: 6ppm
    - To HK Island
      - Density: 6ppm
    - To NW NT & Lantau
      - Density: 6ppm
    - To Yuen Long
      - Density: 6ppm

- Light Rail
  - AM Peak Hour Occupancy Rate
    - To NW NT
      - Density: 6ppm
    - To SE NT
      - Density: 6ppm

- Private Car
  - AM Peak Hour Occupancy Rate
    - To SW NT
      - Density: 6ppm
    - To NW NT
      - Density: 6ppm

- Bus
  - AM Peak Hour Occupancy Rate
    - To SW NT
      - Density: 6ppm
    - To NW NT
      - Density: 6ppm

Model Network - Highway

Yuen Long Highway Usage

- Yuen Long Highway
  - Expansion

- New Highway & Railway

- More local job opportunities

Mitigation

1. Yuen Long Highway Expansion

Turning Yuen Long Highway into a dual 4-lane highway will increase the capacity of the congested highway, thus reduces the traffic of external network.

2. Internal Public Transportation Services

To reduce the vehicle flow on local distributors, more public transport, i.e. public buses, environmentally friendly transport services can be provided to facilitate the passenger flow commuting to MTR stations or Light Rail stations.

3. New Highway & Railway

The construction of a new highway and railway connecting the Northwest New Territories and the Hong Kong Island will alleviate the traffic of Tai Lam Tunnel and the West Rail Line.

4. More local job opportunities

By providing more local job opportunities in the Northern part of New Territories, the congestion of Tai Lam Tunnel can be alleviated, and the San Tin Highway can be better utilized.

Direction

8-9 am

5-7 pm

Added

V/C ratio

EB

WB

AM

86%

98%

PM

94%

102%

99%

V/C ratio

EB

WB

Yuen Long Highway

SAN TIN

HIGHWAY

TAI LAM TUNNEL

Yuen Long Highway Usage

- V/C ratio
  - EB: 98%
  - WB: 100%
  - AM: 109%
  - PM: 97%

- EB: 86%
  - WB: 92%
  - AM: 97%
  - PM: 85%

- EB: 86%
  - WB: 92%
  - AM: 97%
  - PM: 85%

External Highway Usage

- Yuen Long Highway
  - V/C ratio
    - EB: 98%
    - WB: 100%
    - AM: 109%
    - PM: 97%

- EB: 86%
  - WB: 92%
  - AM: 97%
  - PM: 85%

- EB: 86%
  - WB: 92%
  - AM: 97%
  - PM: 85%

Internal Network - Light Rail

Mode Choice of YLS Residents

- Yuen Long
  - Mode Choice
    - Light Rail: 3.5%
    - Light Bus: 11.5%
    - Private Car: 85.0%

- Light Rail: 85.0%
  - Northbound
    - 9
    - PM
    - V/C: 88%
    - 9
    - AM
    - V/C: 93%

- Light Rail: 85.0%
  - Southbound
    - 9
    - PM
    - V/C: 88%
    - 9
    - AM
    - V/C: 93%

- Light Rail: 85.0%
  - Northbound
    - 9
    - PM
    - V/C: 88%
    - 9
    - AM
    - V/C: 93%

- Light Rail: 85.0%
  - Southbound
    - 9
    - PM
    - V/C: 88%
    - 9
    - AM
    - V/C: 93%
03 COMMUNITY FACILITY IMPACT ASSESSMENT

Methodology

LEVEL Supply-Demand Gap Analysis
QUALITY Data Analysis
ACCESS GIS Network Analysis

Land Use Distribution

Community Facilities Map

Supply-Demand Analysis - Educational Facilities

Assumptions

- kindergarten: 8.3 ha
- Primary School: 5.8 ha
- Other Community Facilities: 5.3 ha

Legend

- Residential - Zone 1
- Residential - Zone 2
- Residential - Zone 3
- Residential - Zone 4
- Residential - Zone 5
- Special Residential
- Divisional Fire Station
- Ambulance Depot
- Primary School
- Kindergarten

Supply-Demand Analysis - Medical Facilities

Assumptions

- Hospital: 0.4 ha
- Fire and Ambulance Station: 0.5 ha

Legend

- District Police Station
- Ambulance Depot
- Divisional Fire Station

Accessibility Analysis

Assumptions

- speed walking: 80 m/min
- speed car: 38.4 km/h

Legend

- Kindergarten
- Points:
  - < 10 mins walking to K1
  - < 10 mins walking to K2
  - < 10 mins walking to K3
  - > 10 mins walking to K3
  - > 10 mins walking to K4

Supply-Demand Ratio is calculated to understand the sufficiency of the provision of educational facilities in YLS at the peak year and in the long term.

Mitigation Measures

1. Optimization of Land Use
   - Convert 1 Primary School to Kindergarten and adopt 'Single Site, Multiple User' approach

2. Improve the Accessibility
   - Provide feeder bus / school bus service to improve the accessibility to Kindergarten

3. Speed up the Construction
   - Speed up the construction of the 2nd 10-year Hospital Development Plan to cope with the demands during peak year

4. Construct an Extension
   - Construct further expansion of Tsui Sha Uk Hospital through making use of the vacant land next to the hospital

Problem Identification

1. Inadequacy of Accommodation of Kindergarten and Secondary School
2. Relatively Low Walkability for Two Kindergartens
3. High Degree of Insufficiency of Hospital Beds at the Peak Year
4. Insufficient Hospital Beds Supply in the Long Term

Sufficiency and Quality Analysis
YUEN LONG SOUTH IMPACT ANALYSIS

**Methodology**

- **Sensitivity**
  - Quality, rarity, ability to accommodate change, maturity and significance in local and regional context

- **Magnitude of change**
  - Physical extent, landscape context, duration and reversibility of the impacts

- **Significance Threshold**
  - A matrix table demonstrating the significance threshold of landscape and visual impact

**Landscape Resources Map**

- LC01 Miscellaneous Urban Fringe Landscape
- LC02 Miscellaneous Urban Fringe Landscape
- LC03 Urban Island and Hillside Landscape
- LC04 Urban Fringe Landscape
- LC05 Hillside Shrubland and Grassland
- LC06 Urban-Typical Hillside Shrubland and Grassland
- LC07 Urban-Typical Agricultural Land
- LC08 Urban-Typical Woody Landscape
- LC09 Urban-Typical Waterbody
- LC10 Urban-Typical Grassland
- LC11 Urban-Typical Forest

**Visual Sensitivity Receivers**

- **VS1 PARK SIGNATURE**
- **VS2 ONE HYDE PARK**
- **VS3 KUNG UM ROAD**
- **VS4 LONG HON ROAD**
- **VS5 TONG YAN SAN TSUEN**
- **VS6 KUNG UM SHAN**

**Mitigation Measures**

- **CONSTRUCTION STAGE**
  - Optimization of construction site

- **OPERATION STAGE**
  - Roadside Planting
  - Green Building Designs

**Photomontage**

- Before Development
- After Development
ECOLOGICAL IMPACT ASSESSMENT

Methodology

**Literatures, Regulations**
- Previous EIA studies
- Protection of Endangered Species of Animals and Plants Ordinance
- Hong Kong Planning Standards and Guidelines

**Mitigation Measures**
- Reduce human disturbance
- Reduce impacts on habitats and species

**Estimation of Impacts**
- Reduce impacts on habitats and species

**Habitats of Conservation Importance**

**Assessment of Habitat Loss After Development**
- **Criteria**
  - Severity of Habitat Loss
  - Habitat Quality
  - Species of Conservation Importance
  - Impact of Loss
- **Habitat Types**
  - Moderate
  - Low to Moderate
  - Low or Negligible
- **Areas Affected**
  - 2.42 ha
  - 100m buffer around watercourses
  - 200.51 ha
  - Most of other habitats

**Baseline Study**
- **Sites**
  - Yeung Ka Tsuen EIS
  - Green Belt
  - Country Park
  - Conservation Areas
- **Conservation Importance**
  - **Habitats**
    - Egretry
    - Yeung Ka Tsuen EIS
    - Green Belt
    - Country Park
    - Conservation Areas

**Species of Conservation Importance**

**Share of Different Species**
- **Birds**
  - 36.5%
  - 7.3%
  - 11.8%
  - 8.0%
  - 4.5%
  - 3.7%
- **Butterflies**
  - 11.8%
  - 6.7%
  - 9.2%
  - 8.1%
  - 7.0%
  - 5.6%
- **Mammals**
  - 11.8%
  - 7.3%
  - 8.0%
  - 4.5%
  - 3.7%
  - 2.6%
- **Reptiles**
  - 11.8%
  - 7.3%
  - 8.0%
  - 4.5%
  - 3.7%
  - 2.6%
- **Dragonflies**
  - 11.8%
  - 7.3%
  - 8.0%
  - 4.5%
  - 3.7%
  - 2.6%
- **Amphibians**
  - 11.8%
  - 7.3%
  - 8.0%
  - 4.5%
  - 3.7%
  - 2.6%

**Indirect Impacts**
- **Construction Phase**
  - Unmitigated construction would affect water quality of watercourses and cause sedimentation. Impacts on hydrology and aquatic fauna are foreseeable.

**Before Development**
- Aquatic macrophytes
- Sedimentation occurs
- Traffic noise
- Dust

**After Development**
- Reduced aquatic macrophytes
- Surface runoff
- No significant effects on propagation numbers

**Operational Phase**
- Potentialy Affected Habitats
  - Inland 
  - Tai Lam Country Park
  - Yeung Ka Tsuen EIS
- **Species**
  - Eastern Cattle Egret
  - Little Egret
  - Chinese Pond Heron

**Susceptibility to Mortality**
- **Direct Mortality**
  - High
  - Low
- **Indirect Impacts**
  - Mitigation Measures
  - Compensation for Hillside Woodland Loss
  - Building Height and Material Restrictions
  - Buffer Zones
  - Pollution Barriers

**Before Development**
- Regional flightlines: 10km above ground
- Large blockage with taller and denser buildings
- Little blockage with shorter buildings

**After Development**
- Moth affected, largest destruction created by the removal of buildings
- Large blockage with taller and denser buildings
- Similar blockage

**Flightlines of Ardeids**
- Impacts of flightlines are shown by comparing building obstruction before and after development.

**Key Ardeids**
- **Eastern Cattle Egret**
  - Local Concern
  - Max. count: 22
- **Little Egret**
  - Potential Regional Concern
  - Max. count: 55
- **Chinese Pond Heron**
  - Potential Regional Concern
  - Max. count: 11
**CONCLUSION**

**SWOT Analysis**

**Strength**
- Access to abundant natural resources and tranquil scenery of Tai Tam Country Park mountain range

**Opportunities**
- Access to well-established facilities and job opportunities due to proximity to other districts
- Development of community amenities and transport network will benefit existing residents in Yuen Long South

**Weakness**
- Environmental degradation as a result of brownfield proliferation and serious pollution issue
- The lack of employment opportunities may be worsened due to the renewal and relocation of brownfield sites
- Development scale is restricted by existing residential areas and mountainous terrain at the south

**Threat**
- The lack of employment opportunities may be worsened due to the removal and relocation of brownfield sites
- Development may pose threat to the ecosystem, native plants and animal species

**Summary of Mitigation Measures**

- **Speed Up the Construction**
  - Construct an Extension
- **New Highway and Railway**
- **Increase Local Job Opportunities**
- **Yuen Long Highway Expansion**
- **Maximization of Land Use**
- **Buffer Zones and Pollution Barriers**
- **Internal Transportation Services**
- **Roadside Planting**
- **Compensatory Hillside Woodland**
- **Green Building Designs Optimization of Construction Sites**
- **Building Height and Material Restriction**

**Weighting Criteria**

- **Building Height and Material Restriction**
- **New Highway and Railway**
- **Increase Local Job Opportunities**
- **Yuen Long Highway Expansion**
- **Maximization of Land Use**
- **Buffer Zones and Pollution Barriers**
- **Internal Transportation Services**
- **Roadside Planting**
- **Compensatory Hillside Woodland**
- **Green Building Designs Optimization of Construction Sites**
- **Building Height and Material Restriction**

**PUBLIC ENGAGEMENT RESPONSE**

Over 600 public engagement responses are reviewed to understand the concerns of the stakeholders in YLS.

**TRAFFIC**
- Overload Interchange: Shap Pat Heung Interchange
- Heavy Vehicle Flow: Tai Lam Tunnel
- High Occupancy Rate: West Rail Line Eastbound
- Reduced V/C Ratio: Yuen Long Highway

**COMMUNITY FACILITIES**
- Better coverage for Fire Station, Police Station, and Ambulance Depot
- Sufficient number of Schools and Hospitals after Mitigated RODP

**LANDSCAPE & VISUAL**
- Existing landscape resources is reserved by integrating green spaces into hard landscape
- Visual attractiveness of the environment is enhanced significantly

**ECOLOGICAL**
- Small extent of irreversible habitat losses and potential harms to existing species
- Direct human impacts could be minimized, allowing species to be less prone to pollution

Overall positive outcome is achieved from baseline to Mitigated RODP. The YLS PDA plan should be adopted with proposed mitigation measures.

**Affected Stakeholders**
- 2400 original residents from existing villages and residential developments
- 100 ha existing brownfield sites
- 14 ha existing active or abandoned agricultural land

**ASPECTS OF MITIGATION**
- Traffic
- Community Facilities
- Landscape and Visual
- Ecological

**CHANGE FROM BASELINE TO MITIGATED RODP**

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**Weighted Score**

0.99