Feasibility Study for Land Formation and Infrastructure Works For Prison Development at Hei Ling Chau

Second Round of Public Consultation

Consultation Digest

May 2004

Civil Engineering Department
Government of the Hong Kong
Special Administrative Region

Mott Connell 萬隆

Project Background

Overcrowding is a long standing problem of our prisons. Also, many facilities are outdated and in archaic conditions. In the long run, the problem is predicted to deteriorate. Government therefore proposes to build a new prison complex with 7,220 penal places. It will group all the existing penal facilities on Hong Kong Island and in Kowloon together with the reception facilities scattered around the territory plus an additional 2,600 places to meet the forecast growth in the penal population up to 2015. To maintain security, the complex will be divided into units and each unit will have its own security wall for effective separation.

Benefits

The new prison complex will not only solve the problems of overcrowding and archaic facilities in the prisons, but will also meet the forecast growth in penal population up to 2015. In addition, the project will bring benefits to the community by:

- achieving considerable economies of scale from the co-location of penal facilities, thus saving recurrent operational and manpower costs to the Correctional Services Department (CSD) in the long term;
- enabling the CSD to run the rehabilitation programmes more effectively and efficiently, to the benefit of the inmates and eventually to the benefit of society as a whole; and
- releasing existing penal sites on Hong Kong Island and in Kowloon for redevelopment to meet other community needs.

Feasibility Study

The Civil Engineering Department (CED), has commissioned Mott Connell Limited (the consultants) in a 2-stage study (the "Study") to examine the engineering feasibility of the land formation and infrastructure works for a new prison complex at Hei Ling Chau.

Currently, we are in Stage 1 of the Study. We have drawn up a preferred option of the land formation and infrastructure works for public consultation. Details of the preferred option are presented in this Consultation Digest.

After completion of the Stage 1 of the Study, we will present the findings and recommendations to the Finance Committee of the Legislative Council. It is only upon the approval of the Finance Committee that we will proceed to Stage 2 of the Study. Detailed assessments of the preferred option, which will include a statutory environmental impact assessment, will then follow.

First Round of Public Consultation

We conducted a first round of public consultation from December 2003 to February 2004. We have consulted a total of 35 parties, including local community groups, green groups and other interest groups, for their views on eight preliminary land formation options and four preliminary fixed crossing options. We have received valuable comments on these preliminary options as well as other views on non-technical aspects of the project.

Comments and concerns on the technical aspects of the land formation and infrastructure works mainly include:

- Potential visual and landscape impacts of the new prison complex, the fixed crossing and the associated land access routes;
- Potential impacts on terrestrial and marine ecology;
- Potential impacts on water quality and tidal flow;
- Planning implications on the conservation and tourism use of South Lantau;
- Potential impacts on the land traffic in South Lantau;
- Potential impacts on fishery; and
- Re-provisioning of the affected anchorage space if the Hei Ling Chau typhoon shelter is partly reclaimed for the land formation.

Preliminary preferences of the public on the preliminary options are:

Land formation
(For location of options, please refer to Annex A)

- Options within the typhoon shelter (i.e. Options B, C and D) are considered more preferable or having lesser impacts; and
- Options A, G and H are considered less preferable or having greater impacts

Fixed crossing and associated land access routes
(For location of options, please refer to Annex B)

- Option 2 is considered more preferable or having lesser impacts; and
- Options 1 and 4 are considered less preferable or having greater impacts

As regards the concerns on the non-technical aspects of the project, they are mainly related to the need for constructing the prison complex and the site search issues. We have responded to these questions during the first round of public consultation. The information about these issues is provided in the Information Pamphlet accompanying this Consultation Digest.

The Preferred Option

We have assessed the eight preliminary land formation options and the four preliminary fixed crossing options based on a set of criteria covering various aspects including visual and landscape impacts, ecology and other environmental aspects, land use, transport, social issues, engineering and cost. The key findings are presented in Annexes A and B.

Based on the findings, we consider that the preliminary land formation options within the typhoon shelter and Option 2 of the fixed crossing together with a bypass around the Mui Wo Town are better than the others. Having balanced the merits and demerits of the options and taking into account the public views collected in the first round of public consultation, we have drawn up a preferred option as shown in Figure 1.

The preferred land formation is an optimized layout of the preliminary options within the typhoon shelter to draw upon the advantages offered by Options B, C and D. It is about 80 hectares in area. For part of the existing anchorage area affected by the reclamation, the consultants propose on-site reprovisioning by reconstructing parts of the existing breakwaters.

For the fixed crossing, we have assessed the merits and demerits of the bridge and tunnel options. Although the bridge option will have greater visual impacts to the environment, it will not require additional reclamation for the approach roads and have lesser temporary impacts on the water quality during construction. Also, the capital and recurrent costs of a bridge will be significantly lower than that of a tunnel. After considering all factors, the consultants recommend the bridge option be adopted.

The consultants estimate that the capital cost of the preferred option of land formation and infrastructure works is about $2.5 billion at September 2003 price level. This estimate will be reviewed in Stage 2 of the Study when more detailed assessments are available.

In summary, the key advantages of the preferred option are:

<u>Land Formation</u>

- Lesser visual impacts
- Minimal impacts on the natural topography and vegetation on Hei Ling Chau
- Minimal impacts on terrestrial and marine ecology
- Lesser impacts on water quality and tidal flow
- Conservation potential of Hei Ling Chau and Sunshine Island not affected
- Better integration with the existing penal institutions on Hei Ling Chau
- No impacts on the existing fairway

Fixed Crossing and Land Access Route (with a bypass)

- Minimal impacts on terrestrial and marine ecology for the fixed crossing; minor local impacts on some plantation and secondary woodland at Mui Wo due to the bypass
- Minimal impacts on Lantau South Country Park
- Minimal impacts on existing and planned land uses
- Archaeological sites not affected
- Efficient traffic connection

Preliminary Assessments of the Preferred Option

Key findings of the preliminary assessments of the preferred option are presented in this Section. We will carry out detailed assessments and refine the preferred option in Stage 2 of the Study. Further public consultation will be carried out during that stage.

Visual and landscape impacts

Land Formation

- Effective screening by the topography of Hei Ling Chau
- Not visible from Peng Chau, Discovery Bay, Lamma Island and Hong Kong Island south
- Only partly visible from Mui Wo, Chi Ma Wan and Cheung Chau
- Minimal impacts on the natural topography and vegetation on Hei Ling Chau

Fixed Crossing

- Readily visible from Peng Chau, Mui Wo and Chi Ma Wan; the visual impacts will be higher at Mui Wo

We will consider mitigation measures including landscaped berms for the land formation and a lightweight bridge structure design with subtle colour scheme for the fixed crossing during Stage 2 of the Study.

Ecology

- Minimal impacts on terrestrial and marine ecology due to the land formation. It will not require massive site formation works on Hei Ling Chau. The shoreline, foreshore and seabed within the typhoon shelter are generally of low ecological value.
- The land access route will not require construction of new roads within the Lantau South Country Park. The bypass will have minor local impacts on some plantation and secondary woodland at Mui Wo.

Regarding the Bogadek's Burrowing Lizards which had previously been reported to be residing on Hei Ling Chau and Sunshine Island, they were not found in the field surveys conducted in the Stage 1 Study. The consultants consider that the land formation works will unlikely affect their habitat on Hei Ling Chau. We will carry out detailed terrestrial and marine ecological surveys in Stage 2 of the Study.

Impacts on water quality and tidal flow

- Critical tidal flow sections to the east of Chi Ma Wan and south of Man Kok Tsui of Lantau Island will not be affected. The new breakwaters and piers of the bridge fixed crossing will have potential local effects on water quality and tidal flows, but it can be minimized by effective mitigation measures
- Temporary water quality impacts during construction of the new breakwaters and land formation works

Impacts on planning of South Lantau

- Lantau South Country Park and the existing and planned land uses in Mui Wo not affected
- Minimal impacts on Mui Wo as a tourism gateway because the operational traffic will use the bypass to gain access to South Lantau Road
- Conservation potential of Hei Ling Chau and Sunshine Island not affected. No natural topography will be affected under the proposed land formation. The preferred option is within the typhoon shelter where there are already existing penal facilities near the shore.

Land traffic impacts on Lantau Island

- Minor impacts on Tung Chung Road and South Lantau Road. Chartered ferry services are anticipated to be the preferred mode of transport for most staff working in the new prison complex. The estimated volumes (counting both in-coming and out-going) of land traffic are 700 vehicles per day and 67 vehicles during the peak hours. It will take up about 8% of the capacity of Tung Chung Road and South Lantau Road during the peak hours.
- Minimal impacts on local roads of Mui Wo Town

Impacts on fishery

- Minor loss of fishing ground
- Potential temporary water quality impacts on nearby fish culture zone due to the dredging and construction works for the new breakwaters.

We will implement mitigation measures to control the impacts to acceptable levels. In addition, close monitoring will be carried out during the construction stage.

Preliminary Sustainability Assessment

The preliminary sustainability assessment draws on results from the various preliminary technical assessments. The key findings are:

- The new prison complex will relieve the problem of overcrowding of existing institutions.

- The co-location of penal facilities at Hei Ling Chau would require less additional manpower in managing the 7,220 penal places due to considerable economies of scale.

- Existing penal sites on Hong Kong Island and in Kowloon could be released for redevelopment to meet other community needs.

- The impacts on landscape quality, natural topography and vegetation, ecology, environment, traffic and recreational resources are not expected to be significant provided that suitable design and appropriate mitigation measures are incorporated.

- For visual impacts, land formation options within the typhoon shelter are preferred. Although the bridge option for the fixed crossing is less advantageous than the tunnel option due to greater visual impacts, the capital and recurrent costs of the bridge option will be significantly lower than that of the tunnel option.

- Further study should be carried out to assess the various impacts in detail, and propose appropriate mitigation measures to minimize the impacts to acceptable levels. Other issues such as penal securities and public views should be carefully addressed.

Your Views

Your views on the preferred option are very important to us. They will form a valuable input for the refinement of the preferred option. Please convey your views to us before 31 July 2004 by:

(a) Post to Chief Engineer/Development
Development Division,
Civil Engineering Department,
2/F, Civil Engineering Building,
101 Princess Margaret Road, Homantin,
Kowloon; or

(b) Fax to 2714 0079; or

(c) Email to ceinfo@ced.gov.hk

Any person submitting views and comments should be aware that the Government may publish all or part of the views and comments received and disclose the identity of the source in such manner as the Government considers appropriate, unless he/she requests any part of the views and comments and/or his/her identity be treated in confidence.

This Consultant Digest and the Information Pamphlet and other relevant information can be found at CED's website www.ced.gov.hk/eng/projects/hlcfs/hlcfs_f.htm.

For enquiries, please call the Development Division of CED at 2762 5670.

Figure 1 - The Preferred Option

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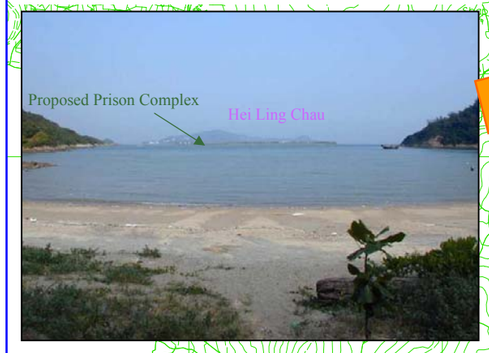
View from Discovery Bay (2)

View from Peng Chau (1)

View from Hong Kong Island (Cyberport) (7)

View from Mui Wo (Silvermine Bay) (3)

View from Chi Ma Wan (4)



View from Cheung Chau North (5)

View from Ferries (6)

Proposed Bypass

Existing Mui Wo Ferry Pier Road

Proposed Fixed Crossing and Access Road

Proposed Breakwaters

Proposed Reclamation Area (about 80 ha)

Existing Breakwater to be Removed

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Annex A

Key Findings of Preliminary Assessments for Land Formation Options

Criteria	Option A	Option B	Option C	Option D	Option E	Option F	Option G	Option H
								
Visual and Landscape	• Readily visible from Peng Chau, Discovery Bay and Hong Kong Island south • Significant loss of natural coastline landscape resources (2.8km) • Moderate loss of natural landscape resources due to new access road to fixed crossing	***2nd favoured*** • Partly visible from Mui Wo • Moderate loss of natural coastline landscape resources (2.4km) within the typhoon shelter	***Most favoured*** • Least visible from Mui Wo compared with Options B and D • Minimal loss of natural coastline landscape resources (1.0km) within the typhoon shelter • Low loss of natural landscape resources due to new access road to fixed crossing	• Most visible from Mui Wo compared with Options B and C • Moderate loss of natural coastline landscape resources (1.5km) within the typhoon shelter	• Readily visible from Hong Kong Island south, Lamma Island and ferry passengers • Moderate loss of natural coastline landscape resources (2.1km) • Moderate loss of natural landscape resources due to new access road to fixed crossing	• Readily visible from Hong Kong Island south, Lamma Island and ferry passengers • Moderate loss of natural coastline landscape resources (2.1km) • Significant loss of wooded slopes and hilltops (36 ha) • Moderate loss of natural landscape resources due to new access road to fixed crossing	• Farthest away from Mui Wo but readily visible from Chi Ma Wan and ferry passengers • Minimal loss of natural coastline landscape resources (0.4km)	• Farthest away from Mui Wo but readily visible from Chi Ma Wan and ferry passengers • Minimal loss of natural coastline landscape resources (0.7km) • Significant loss of wooded slopes and hilltops (16.4ha)
Ecology	• High ecological value shoreline affected (2.8km) • Higher impacts on corals	• Low ecological value shoreline affected (2.4km) • No impacts on corals	***Most favoured*** • Low ecological value shoreline affected (1.0km) • No impacts on corals	***2nd favoured*** • Low ecological value shoreline affected (1.5km) • No impacts on corals	• High ecological value shoreline affected (2.1km) • Low impacts on corals	• Significant impacts on terrestrial habitats (36 ha) • High ecological value shoreline affected (2.1km) • Low impacts on corals	• High ecological value shoreline affected (0.4km) • Low impacts on corals	• Significant impacts on terrestrial habitats (16.4 ha) • High ecological value shoreline affected (0.7km) • Low impacts on corals
Environmental Aspects (Other) - *Tidal flow and water quality* - *Construction air and noise*	• Lesser impacts on tidal flow and water quality • Low impacts on existing institutions	***Most favoured*** • Least impacts on tidal flow and water quality compared with other options • High impacts on existing institutions	***Most favoured*** • Least impacts on tidal flow and water quality compared with other options • High impacts on existing institutions	• Lesser impacts on tidal flow and water quality • Highest impacts on existing institutions	• Lesser impacts on tidal flow and water quality • Moderate impacts on existing institutions	• Lesser impacts on tidal flow and water quality • Moderate impacts on existing institutions	• Significant impacts on tidal flow and water quality ***Most favoured*** • Least impacts on existing institutions	• High impacts on tidal flow and water quality ***2nd favoured*** • Low impacts on existing institutions
Land Use	• Conservation potential of Sunshine Island affected • Incompatible with existing natural character	***Most favoured*** • Re-provisioning of typhoon shelter required (35ha) • Compatible with existing land use character	***Most favoured*** • Re-provisioning of typhoon shelter required (35ha) • Compatible with existing land use character	• Re-provisioning of typhoon shelter required (50ha) • Compatible with existing land use character	• Incompatible with existing natural character	• Conservation potential of Hei Ling Chau significantly affected • Incompatible with existing natural character	• Incompatible with existing natural character	• Conservation potential of Hei Ling Chau affected • Incompatible with existing natural character
Transport	• Long travel distance to fixed crossing (4.5km) • Widening of existing roads (0.7km) and construction of new roads required (1.5km) • Low impacts on marine traffic	***Most favoured*** • Direct connection with fixed crossing • Widening of existing roads and construction of new roads not required • No impacts on marine traffic	• Long travel distance to fixed crossing (3.9km) • Widening of existing roads (1.0km) and construction of new roads required (0.3km) • No impacts on marine traffic	***Most favoured*** • Direct connection with fixed crossing • Widening of existing roads and construction of new roads not required • No impacts on marine traffic	• Long travel distance to fixed crossing (4.0km) • Widening of existing roads (0.7km) and construction of new roads required (1.0km) • Low impacts on marine traffic	• Long travel distance to fixed crossing (3.7km) • Widening of existing roads (0.6km) and construction of new roads required (0.9km) • Low impacts on marine traffic	• Direct connection with fixed crossing (Option 4) • Widening of existing roads (1.0km) and construction of new roads required (0.6km) (for connection with existing institutions) • Highest impacts on marine traffic	• Direct connection with fixed crossing (Option 4) • Widening of existing roads (1.0km) and construction of new roads required (0.6km) (for connection with existing institutions) • Highest impacts on marine traffic
Social Issues	• Two high quality beaches and water sport activities affected • Large loss of fish catching area (82ha) • Potential temporary impacts on existing fish culture zones	***2nd favoured*** • Small loss of fish catching area (35ha) • Potential temporary impacts on existing fish culture zones	***Most favoured*** • Small loss of fish catching area (35ha) • Potential temporary impacts on existing fish culture zones • Least security concerns to local residents compared with Options B and D	• Moderate loss of fish catching area (50ha) • Potential temporary impacts on existing fish culture zones	• Large loss of fish catching area (85ha) • Potential temporary impacts on existing fish culture zones	• Moderate loss of fish catching area (45ha) • Potential temporary impacts on existing fish culture zones	• Large loss of fish catching area (84ha) • Potential temporary impacts on existing fish culture zones	- Moderate loss of fish catching area (69ha) - Potential temporary impacts on existing fish culture zones
Engineering /Cost	• Relocation of an existing submarine watermain required • Capital cost: $1.40B • Recurrent cost: $10.1M	• Relocation of existing breakwater required (1.82km) • Interface constraints with existing institutions and typhoon shelter • Capital cost: $1.52B • Recurrent cost: $9.8M	• Relocation of existing breakwater required (1.46km) • Interface constraints with existing institutions and typhoon shelter • Efficient layout for prison facilities • Capital cost: $1.46B • Recurrent cost: $10.0M	***2nd favoured*** • Relocation of existing breakwater required (1.75km) • Interface constraints with existing institutions and typhoon shelter • Efficient layout for prison facilities • Capital cost: $1.49B • Recurrent cost: $10.0M	***Most favoured*** • Least construction difficulties and interface constraints • Capital cost: $1.53B • Recurrent cost: $10.2M	• Significant amount of slope cutting and excavation works required • Capital cost: $1.65B • Recurrent cost: $10.2M	• Interface constraints with existing typhoon shelter and marine traffic • Inefficient layout for prison facilities • Capital cost: $1.53B • Recurrent cost: $10.1M	• Interface constraints with existing typhoon shelter and marine traffic • Significant amount of slope cutting and excavation works required • Inefficient layout for prison facilities • Capital cost: $1.57B • Recurrent cost: $10.1M

Key Findings of Preliminary Assessments for Fixed Crossing Options

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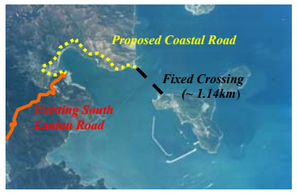
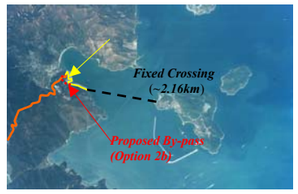
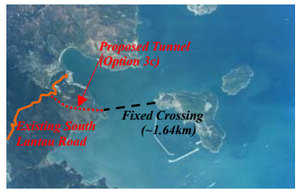
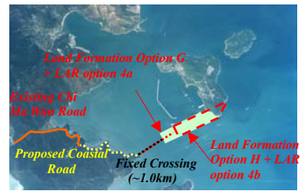
Criteria	Option 1		Options 2a and 2b *		Options 3a and 3b *		Option 3c		Option 4	
										
	Form of Fixed Crossing		**Form of Fixed Crossing**		**Form of Fixed Crossing**		**Form of Fixed Crossing**		**Form of Fixed Crossing**	
	Bridge	**Tunnel**	**Bridge**	**Tunnel**	**Bridge**	**Tunnel**	**Bridge**	**Tunnel**	**Bridge**	**Tunnel**
Visual and Landscape	• Significant loss of landscape resources due to the land access route to Mui Wo (4.1km)		***2nd favoured (Option 2a) - Tunnel*** • Minimal loss of landscape resources due to the by-pass for Option 2b (0.4km)		• Moderate loss of landscape resources due to the land access route to Mui Wo (Option 3a: 1.0km; Option 3b: 1.4km)		***Most favoured - Tunnel*** • Minimal loss of landscape resources due to the tunnel portals and ventilation shafts for tunnel connection to South Lantau Road		• Significant loss of landscape resources due to the land access route at Chi Ma Wan (2.2km)	
	• Bridge fixed crossing readily visible from Discovery Bay, Peng Chau, Mui Wo and Chi Ma Wan	• Tunnel portals and ventilation shafts visible from Discovery Bay, Peng Chau, Mui Wo and Chi Ma Wan	• Bridge fixed crossing readily visible from Peng Chau, Mui Wo and Chi Ma Wan	• Tunnel portals and ventilation shafts visible from Peng Chau, Mui Wo and Chi Ma Wan	• Bridge fixed crossing readily visible from Peng Chau, Mui Wo and Chi Ma Wan	• Tunnel portals and ventilation shafts visible from Peng Chau, Mui Wo and Chi Ma Wan	• Bridge fixed crossing readily visible from Peng Chau, Mui Wo and Chi Ma Wan	• Tunnel portals and ventilation shafts visible from Peng Chau, Mui Wo and Chi Ma Wan	• Bridge fixed crossing readily visible from Chi Ma Wan and Cheung Chau	• Tunnel portals and ventilation shafts visible from Chi Ma Wan and Cheung Chau
Ecology	• Significant impacts on terrestrial habitats • Higher impacts on corals		***Most favoured (Option 2a)*** • Minimal impacts on terrestrial habitats for Option 2a, whilst Option 2b may have minor local impacts • No impacts on corals		• Moderate impacts on terrestrial habitats • Low ecological value shoreline affected (1.0km) • No impacts on corals		***Most favoured*** • Minimal impacts on terrestrial habitats due to the tunnel portals and ventilation shafts for tunnel connection to South Lantau Road • No impacts on corals		• Significant impacts on terrestrial habitats • Low ecological value shoreline affected (2.0km) • Low impacts on corals	
Other Environmental Aspects	• Moderate operational traffic air and noise impacts • Four known archaeological sites affected		***2nd favoured (Option 2b) - Bridge*** • Moderate operational traffic air and noise impacts, with Option 2b having lesser impacts compared with Option 2a		***2nd favoured (Option 3b) - Bridge*** • Moderate operational traffic air and noise impacts, with Option 3b having lesser impacts compared with Option 3a		***Most favoured - Bridge*** • Moderate operational traffic air and noise impacts		• Low operational traffic air and noise impacts • Two known archaeological sites affected	
	• Lesser impacts on tidal flow and water quality	• Higher temporary impacts on tidal flow and water quality compared with the bridge fixed crossing but lesser long term impacts	• Lesser impacts on tidal flow and water quality	• Higher temporary impacts on tidal flow and water quality compared with the bridge fixed crossing but lesser long term impacts	• Lesser impacts on tidal flow and water quality	• Higher temporary impacts on tidal flow and water quality compared with the bridge fixed crossing but lesser long term impacts	• Lesser impacts on tidal flow and water quality	• Higher temporary impacts on tidal flow and water quality compared with the bridge fixed crossing but lesser long term impacts	• Highest impacts on tidal flow and water quality among all bridge fixed crossing options	• Higher temporary impacts on tidal flow and water quality compared with the bridge fixed crossing but lesser long term impacts
Land Use	• Incompatible with existing natural character due to the new road at Mui Wo • Significant impacts on private lots (3.3ha) and land resumption required		***Most favoured (Option 2b), 2nd favoured (Option 2a)*** • Minimal impacts on Lantau South Country Park • Re-provisioning of an existing helipad required • No private lots affected • More compatible with tourism and existing land use in Mui Wo for Option 2b compared with Option 2a		• Construction of new roads within Lantau South Country Park required (1.0km) • Re-provisioning of an existing helipad required • No private lots affected • More compatible with tourism and existing land use in Mui Wo for Option 3b compared with Option 3a		• Construction of tunnel portals and ventilation shafts within Lantau South Country Park required • No private lots affected • A graveyard affected (7.3ha) • More compatible with tourism and existing land use in Mui Wo		• Construction of new roads in the Lantau South Country Park required (2.0km) • Significant impacts on private lots (2.4ha) and land resumption required • Incompatible with the planning of the country park and natural setting in Chi Ma Wan Peninsula	
Transport	• Significant traffic impacts on Mui Wo Town • Distance from Tung Chung Road**: 12.3km		***Most favoured (Option 2b)*** • Minimal traffic impacts on Mui Wo Town, with lesser impacts for Option 2b compared with Option 2a • Distance from Tung Chung Road**: 9.5km		***2nd favoured (Option 3b)*** • Minimal traffic impacts on Mui Wo Town, with lesser impacts for Option 3b compared with Option 3a • Distance from Tung Chung Road**: 9.8km		***2nd favoured*** • Minimal traffic impacts on Mui Wo Town • Distance from Tung Chung Road**: 9.7km		• Minimal traffic impacts on Chi Ma Wan; upgrading of Chi Ma Wan Road required to improve the standard • Distance from Tung Chung Road**: 9.7km	
Social Issues	• The new road at North Mui Wo considered by some local communities as improved infrastructure		***2nd favoured (Option 2b)*** • Less impacts on tourism at Mui Wo for Option 2b compared with Option 2a due to the traffic diversion by the by-pass		***Most favoured (Option 3b)*** • Less impacts on tourism at Mui Wo for Option 3b compared with Option 3a due to the traffic diversion by the by-pass		• Less impacts on tourism at Mui Wo due to the traffic diversion by the tunnel connection to South Lantau Road • Potential fung shui issue due to tunnel connection to South Lantau Road passing underneath a graveyard		• Natural coastline / beaches for recreation at Chi Ma Wan affected	
Engineering/ Cost	• Significant amount of slope cutting and excavation works required for the new access road		***Most favoured (Option 2a) - Bridge*** • Minimal amount of slope cutting and excavation works required for the by-pass		***2nd favoured (Option 3a) - Bridge*** • Moderate amount of slope cutting and excavation works required for the new access road		• Significant amount of slope cutting and excavation works required for the tunnel connection to South Lantau Road		• Significant amount of slope cutting and excavation works required for the new access road	
	• Capital cost: $1.23B • Recurrent cost: $3.6M	• Capital cost: $2.37B • Recurrent cost: $9.7M	• Capital cost: $0.81B (2a) $0.90B (2b) • Recurrent cost: $2.1M (2a) $2.4M (2b)	• Capital cost: $2.53B (2a) $2.61B (2b) • Recurrent cost: $10.0M (2a) $10.4M (2b)	• Capital cost: $0.78B (3a) $0.87B (3b) • Recurrent cost: $2.3M (3a) $2.6M (3b)	• Capital cost: $2.33B (3a) $2.42B (3b) • Recurrent cost: $9.6M (3a) $9.9M (3b)	• Capital cost: $1.39B • Recurrent cost: $7.7M	• Capital cost: $2.88B • Recurrent cost: $14.8M	• Capital cost: $1.15B (4a) $1.27B (4b) • Recurrent cost: $4.3M (4a) $4.6M (4b)	• Capital cost: $2.08B (4a) $2.37B (4b) • Recurrent cost: $10.0M (4a) $10.9M (4b)

Remark: * The difference between Options 2a and 2b is that Option 2b has a by-pass of about 350m in length. The same applies to Option 3a and Option 3b

** From junction of Tung Chung Road and South Lantau Road to eastern end of fixed crossing