Section A

Cluster 4: Fieldwork

1 A group of 4 junior college students was given an assignment for the one-week school holiday in September to examine the effectiveness of road safety measures in enhancing the safety and liveability of housing estates in Singapore for the elderly.

The students' key geographical question was: "How can the inadequacies of road safety measures in housing estates in Singapore be improved to enhance safety for the elderly?".

To explore this, they first conducted secondary research on the locations where road safety measures had been put in place to cater to the needs of the elderly. They eventually decided to conduct observations and questionnaire surveys in Ang Mo Kio Street 31 where the Friendly Streets initiative was piloted. This initiative by the Land Transport Authority (LTA) aims to make daily journeys to key amenities in neighbourhoods safer, more convenient and comfortable for those walking or cycling.

The observations and questionnaire surveys were conducted on a weekday, between 12 to 2pm. The students used the first 30 minutes to individually take photographs of the road safety measures along Ang Mo Kio Street 31. They then conducted questionnaire surveys in pairs by stationing themselves at the signalised crossings at Blk 314 and Blk 320 respectively. They approached every elderly person who walked past them to administer the questionnaire survey. The students administered the survey to a total of 18 elderly.

Resource 1 shows photographs of the road safety measures that are part of the Friendly Streets initiative implemented in Ang Mo Kio Street 31. Resource 2 is a map of the designated Friendly Street at Ang Mo Kio Street 31 and its vicinity. Resource 3 shows the profile of the respondents to the questionnaire survey. Resource 4 shows the findings from the questionnaire survey.

(a) Explain why the students' geographical question may not be appropriate for the investigation. [4]

Possible points:

- Inappropriate scale/ scale was too large and/or unmanageable – the geographical question stated "housing estates in Singapore" but this was not feasible for the small team of 4 students, and the given time frame of 1 week.
- This is not an ideal geographical question because it contains a presumed outcome that the road safety measures are inadequate → leads to some level of bias in conducting investigation.

(b) Suggest how the students could minimise potential risks during data collection. [6]

Possible points:

- Preamble stated conduct of investigation during 12 to 2 pm + Resource 1 shows that the locations have minimal shade → risk of heat exhaustion → students could either conduct their investigation at another time (before 10 or after 3 pm) or ensure heat protection like caps and have
- Preamble stated that the students took photos individually → risk of inattentiveness and possible accidents (e.g. collision with pedestrians or cyclists) → work at least in pairs so that while one person is taking photos/collecting data, the other person could look out for oncoming cyclists or pedestrians

- Resource 1A shows that the signalised crossings where the students conducted their questionnaire surveys are also used by cyclists → risk of collisions → work at least in pairs so that while one person is taking photos/collecting data, the other person could look out for oncoming cyclists or pedestrians

(c) Explain how the students could minimise the impact of their investigation. [5]

Possible points:

- Resource 1 – obstruction to cyclists and pedestrians who are trying to use the path or cross the road; kerbless crossing shown in 1B is also particularly narrow → they may not want to administer their questionnaire surveys at the signalised crossings as this would take some time and thus pose as an obstruction to others. They could administer the survey at the void decks instead. When taking photo at the kerbless crossing shown in 1B, they should do so when there no other cyclists or pedestrians around.
- Inconvenience to respondents who may be delayed from carrying out their intended activity → students should ask if the respondents are in a hurry/ have time to spare, stating the estimated timed needed for the survey.
- When taking photographs of the road safety measures, students should wait and ensure that no pedestrians are in the frame so as to avoid any invasion of privacy if the pedestrians were captured in the photo.

(d) With reference to Resource 3, explain why the respondents to the questionnaire survey may not be representative of the elderly residents in Ang Mo Kio Street 31. [5]

Things to note:

- *Award 1 mark for an explanation of why the respondents may not be representative of the elderly residents in AMK St 31.*
- *Award 1 additional mark for further development of how they differ.*

Possible points:

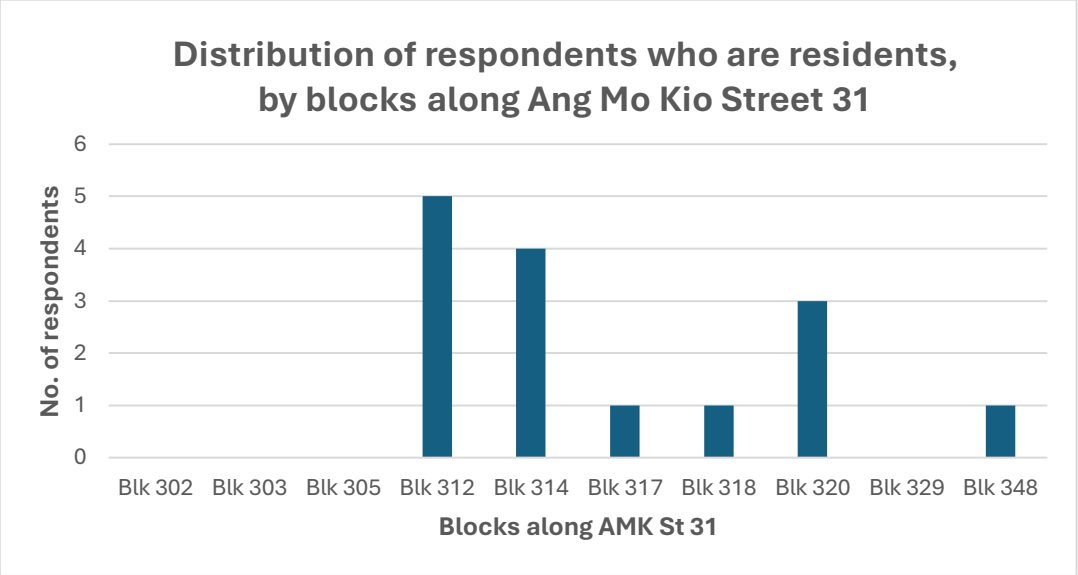
- **Small sample size – 18 only** → hence, this may not be very representative of all the elderly living in AMK St 31 since there are several housing blocks along the street, and thus a sizeable number of elderly.
- **Predominantly female – 11 of 18 respondents** → hence, this may not be very representative as female elderly and male elderly are likely to have different expectations of/experiences with road safety measures, considering differences in lifestyle choices or routines. Hence, having disproportionately more female than male respondents might skew the results of the investigation, reducing representativeness and reliability.
- **Predominantly in the youngest age range of 65-69 – 12 of 18 respondents** while there were none in the >80 age group → hence, this may not be very representative as the different age profiles are likely to have different expectations of/experiences with road safety measures, considering differences their mobility levels and routines. Hence, having disproportionately more respondents might skew the results of the investigation, reducing representativeness and reliability.
- **Majority from Blks 312 and 314 – total of 9 of 18 respondents**; while some blocks (302-305, 329) were not represented at all. → hence, this may not be very representative as residents living in different areas along AMK St 31 may

experience different forms of road safety measures. Hence, having disproportionately more respondents from only a select group of blocks in close proximity to each other (or nearer AMK Ave 8) might skew the results of the investigation, reducing representativeness and reliability.

(e) With the aid of a sketch diagram, explain how the students could better represent the data on distribution of respondents who are residents, by blocks along Ang Mo Kio Street 31 as seen in Resource 3. [5]

Possible points:

- The table does not allow for ease of visual comparison (1m).
- A possible alternative would be a **bar graph** which allows for the no. of residents in each block to be depicted in relation to that in other blocks, hence facilitating comparisons (1m).
- Features of bar graph:
  - Correct labelling of axes (1m)
  - Accurate plotting and labelling of data (1m)
  - Title of diagram (1m)



(f) With reference to Resource 4, describe the elderly's views on how the road safety measures have enhanced the safety and liveability in their housing estate. [5]

Possible points:

- There are **mixed views from the elderly** in terms of the extent to which the road safety measures have enhanced safety and liveability in their housing estate. (1m)
- **Regarding road safety**:
  - While all of the respondents (100%) agree/ strongly agree that the road safety measures have led to safer roads (Qn A(i))(1m), a majority of the respondents (61%) felt that pedestrians won't look out for vehicles as they assume drivers will slow down for them. (1m) In addition, based on the qualitative comments in Qn B, it seems that there might still be jaywalking, which suggests that the road safety measures have not fully addressed road safety concerns (1m).

- **Regarding walkability/overall convenience/liveability**
  - While majority of the respondents (66.7%) indicated that the road safety measures encouraged them to walk more which could thus address their physical needs(1m), it is noted in the qualitative comments in Qn B that some found walking to the signalised crossings were too far/inconvenient. (1m)
  - There is also a same no. of respondents who agreed vs disagreed that the Friendly Streets initiative have made AMK a more age-friendly housing estate (1m).

(g) The students concluded that the road safety measures implemented in Ang Mo Kio Street 31 was not effective in enhancing the safety and liveability of the housing estate for its elderly residents as there were several areas for improvement.

Evaluate the validity of their conclusion. [10]

Points for consideration:

- As the students' **geographical question** presumed that there were inadequacies in the road safety measures, this might have caused them to put more focus on looking out for areas for improvement rather than consider both the advantages and disadvantages of the measures. An evidence for this is how the only open-ended question in the questionnaire survey as shown in Resource 4 only focuses on what improvements respondents would suggest. Respondents were not given an option to indicate if they felt that improvements were necessary.

- The **sample** may not have been representative of the views of elderly residents living on Ang Mo Kio Street 31 → hence, the information collected might have been somewhat skewed and may not be fully reliable:
  - The students' choice of conducting the fieldwork on a weekday, between 12 to 2pm is rather limiting as it was during lunch time and also the hottest period of the day. This might have resulted in there being less residents (much less elderly) who are outdoors at this point in time.
  - The students' choice of administering the questionnaire survey at the signalised crossings also increased the probability of accessing respondents who are relatively mobile – Resource 3 indicates that majority of the respondents are 65-69 years old, while there are none who are ≥80.
  - The students' choice of administering the questionnaire survey at the signalised crossings at Blks 314 and 320 also increased the probability of accessing respondents who live in the vicinity of these blocks – Resource 3 indicates that majority of the respondents lived in Blks 312, 314 and 320 which are the nearest to the signalised crossings the students were at.

- **Findings from the survey** also do not seem to fully support the conclusion:
  - Majority (100%) indicated that the road safety measures have made it safer for the elderly to get around their neighbourhood.
  - Majority (67%) indicated that the road safety measures have encouraged them to walk more in their neighbourhood → addresses physical needs.

- However, it must be noted that there is some validity in the conclusion, as seen from the responses to the questionnaire survey:
  - Majority (61%) indicated that the road safety measures may lead to pedestrians being less careful when crossing the road as they assume drivers will slow down for them.

- The qualitative comments also suggest that the road safety measures have compromised somewhat on convenience and has not helped to completely curb unsafe behaviour such as jaywalking.

Section B

Cluster 3: Sustainable Future and Climate Change

2 Resource 5 shows an infographic showing projections of the world's fastest growing cities in 2018. Resource 6 shows waste generation rates in selected Ethiopian cities. Resource 7 shows the population size and poverty rate of selected Ethiopian cities, expressed as a percentage of the population whose expenditure on food and non-food items falls below the official national poverty line. Resource 8 is an article on the the Koshe landfill in Addis Ababa, Ethiopia. Resource 9 provides information on the Reppie waste-to-energy incineration plant in Addis Ababa, Ethiopia and how it compares with the recycling chain involving the informal waste sector.

(a) With reference to Resource 5, describe the distribution of the projections of the world's fastest growing cities in 2018. [4]

Answer Guide:

- The majority of the world's fastest growing cities are projected to be in Africa [1m], with 17 of the 20 cities being from African countries. [1m]
    - Within Africa, Nigeria has the most cities projected to be within the top 20 world's faster growing cities, with 4 cities. [1m]
- Only 1 city in India, Bangladesh and China are projected to be within the top 20 world's faster growing cities. [1m]

(b) With reference to Resource 5, explain why countries like China may be experiencing slowing urban population growth. [4]

Answer Guide:

- China is an emerging economy and is developing rapidly/ is relatively more developed compared to other less developed countries [1m].
- Countries that have a higher level of development are more likely to have a lower rate of natural increase due to declining birth rates [1m]. Possible reasons include [1 additional mark]:
    - Cost of living increases → deterrent to having many children
    - Changes in role and priorities of women → choose to have less children
- Cities in countries at a higher level of development are also likely to experience trends of counter-urbanisation [1m]. Possible reasons include [1 additional mark]:
    - Crowding and pollution in cities → relatively more spacious and less polluted environments in suburbs or outside of city

(c) Describe the differences in problems associated with with non-hazardous solid waste in urban areas of developed and less developed countries. [6]

Things to note:

- *Award 1 mark for identification of an area of difference between urban areas of developed and less developed countries.*
- *Award 1 additional mark for further development of how they differ.*

Answer Guide:

Developed	Basis of Comparison	Developing

Higher	**Quantity of waste generated**	Lower
Lower	**Waste Composition -** Proportion of organic to inorganic material generated	Higher
Difficulties and high costs of disposing the large of waste	**Nature of problems of waste management**	Collection of waste
Lower	**Environmental & health risks**	Higher

(d) With reference to Resource 7, suggest reasons for the difference in waste generation rate for Addis Ababa compared to other Ethiopian cities as shown in Resource 6. [6]

Things to note:

- *Award 1 mark for identification of the difference in waste generation rate for Addis Ababa compared to other Ethiopian cities.*
- *Award 1 mark for an explanation of why waste generation rates differ between Addis Ababa and other Ethiopian cities, to a maximum of 5 marks.*
- *Award a maximum of 1 additional mark for further development of each explanation, where applicable.*

Possible points:

- Based on Resource 6, Addis Ababa has the highest waste generation rate at 1132 tons per day compared to the other Ethiopian cities. [1m]
- Resource 7A:
    - Addis Ababa is likely to have the highest waste generation rate as it is considered one of the Largest cities and also within the "High" category in terms of population size [1m].
    - A higher population size suggests greater consumption rates which leads to higher waste generation [1 additional mark].
- Resource 7B:
    - Addis Ababa is likely to have the highest waste generation rate as Addis Ababa has a relatively lower poverty rate/ third lowest poverty rate compared to the other Ethiopian cities, where only 16.8% of the population has an expenditure on food and non-food items below the official national poverty line. [1m]
    - This suggests that the population in Addis Ababa has a relatively higher disposal income compared to the other cities [1 additional mark].
    - In general, there is a positive correlation between waste generation and income level as the population is more financially able to enjoy a higher consumption rate which leads to higher waste generation [1 additional mark].

(e) With reference to Resource 8, explain how the Koshe landfill could both hinder and contribute to sustainable urban development in Addis Ababa. [5]

Things to note:

- *Award 1 mark for each explanation of how the Koshe landfill could both hinder and contribute to SUD.*
- *Award a maximum of 1 additional mark for further development of each explanation, where applicable.*

Possible points:

Dimension	Hinders SUD	Contributes to SUD
Social	• The Koshe landfill poses health risks to the residents who stay in the area due to the inadequate buffer between the landfill and other land use activities [1m]. • Due to the inadequate buffer, there is a higher probability that residents are exposed to potential diseases passed on by pests/rodents associated with landfills or because they scavenge for food from the landfills [1 additional mark]. • The steep cliffs of garbage that are prone to collapse also pose a safety risk to the residents. [1m] • As the landfill is not fenced and the collapse could occur suddenly, residents are likely to experience injury/death due to their proximity. [1 additional mark].	• The potential income generated from scavenging and sales of recovered materials from the landfill could offer residents a means to finance their daily needs such as for food or shelter [1m].
Environmental	• As it is an open landfill with an inadequate buffer, there is a high likelihood that leachate from the landfill could pollute land and water sources in the area [1m]. • The breakdown of waste in the landfill is also likely to contribute to air pollution or unpleasant fumes [1m].	• The recovered materials from the landfill have a value in recycling and this contributes to more circular metabolism for the city [1m]. • Recycling lowers the total volume of waste for disposal, and also lowers the demand for new resources for production of goods & services. [1 additional mark].
Economic	• Scavenging is a low-skilled job with low and unstable income and may not help with the long-term economic growth of the city since it does not generate much revenue. [1m]	• The sales of recovered materials to businesses and farmers potentially lowers the cost of their production, hence contributing to their economic growth [1m].

	• Moreover, as these scavengers are likely informally employed, their income is not likely to be tracked officially and hence does not contribute towards the economic growth of the city directly. [1 additional mark]	• The potential income generated from scavenging and sales of recovered materials from the landfill could offer residents a means to finance the educational needs of their children and allows them a higher chance of attaining better paying employment in the future. [1m]

(f) With reference to Resource 9, explain why waste-to-energy incineration plants may not be fully sustainable.

[5]

Things to note:

- *Award 1 mark for each explanation of why waste-to-energy incineration plants may be sustainable, up to a max of 2m.*
- *Award 1 mark for each explanation of why waste-to-energy incineration plants may not be sustainable.*
- *Award a maximum of 1 additional mark for further development of each explanation, where applicable.*

Possible points:

Dimension	Hinders SUD	Contributes to SUD
Economic	• The implementation of the WTE plant is likely to replace the need for scavengers since the waste would now be incinerated and not recycled. [1m] Resource 9B suggests that the waste-to-energy (WTE) plant will generate very low employment compared to the recycling chain [1 additional mark]. As such, this might lead to a loss of income for the people. [1 additional mark] • Moreover, Resource 9B also states that the skill level required for operation of the WTE is higher compared to that of being involved in the informal waste sector. Hence, residents who were previously scavenging are unlikely to be able to be employed by the plant and might face a loss of income. [1m] • The plant also seems to require a large financial outlay for its operation [1m] as Resource 9A suggests that foreign and private sector assistance was required and Resource 9B indicates that it requires "very high-high" investment and operation costs [1 additional mark] → as such, Ethiopia may not be able to sustain such an investment in the long-run, without assistance from other countries or the private sector, and hence this may result in some degree of economic insecurity in view of this dependence. [1 additional mark]	• As there may be some employment of residents in by the WTE plant which entails a higher skill set as suggested in Resource 9B, residents may receive training which would enhance their employability in the future and allow access to better paying jobs. [1m]
Social	• Due to the loss of employment/ lesser employment opportunities, residents may have less income stability and this would hinder their ability to afford daily necessities [1m].	• The WTE plant allows for high waste volume reduction as suggested in Resource 9B as waste is burnt, and this would lower the health

		risks that residents experienced in living near the open landfill. [1m]
Environmental		• The combustion of waste via the WTE plant to boil water to produce steam for electricity generation leads to a more circular metabolism for the city as the waste gases from burning of the waste is turned into an energy source [1m]. The combustion process effectively reduces the volume of waste as stated in Resource 9B, and also reduces the demand for new energy sources to generate electricity. [1 additional mark]

Section C

3 Evaluate the view that it is impossible to create liveable cities for women. [20]

Possible Approaches:

Candidates could approach the question by making a judgement on whether strategies have been effective in addressing the issues faced by women living in cities, in order to justify the extent to which it is possible to then create liveable cities for women.

This can be done through a consideration of criteria to evaluate these strategies such as:

- The ability to address the root cause of issues that women face that diminish the ability to create liveable cities for women – e.g. addressing traditional views on gender & gender roles as they serve as the underlying mindset driving discriminatory practices, etc.
- The ability to comprehensively address the issues faced by women that compromise the ability to create liveable cities for women – e.g. strategies can address psychological and socio-economic issues impacting liveability of cities for women
- The ability to address the issues faced by women in a sustained manner (i.e. long-term) in order to create liveable cities for women

Candidates could approach the question by making a judgment on whether strategies used to address the issues faced by women living in cities have been successful through a consideration of two or more case studies.

- Candidates could evaluate whether the strategies in each case study achieved the intended aims or targets.
- Candidates could also analyse the contextual factors such as the level of development of the country and the affordability of these strategies which may have contributed to the extent of success of the strategies. Candidates could also analyse the challenges to success which are common across the case studies.

Levels marked using Generic Level Descriptors for 20m H2 essays

4 "Adaptation is more important than mitigation in managing the effects of climate change."

Evaluate this statement. [20]

Possible Approaches:

- Candidates could approach the question by making a judgement on whether **adaptation, as compared to mitigation**, is **more important** to manage climate change and its effects.
    - SOME possible overall approaches:
        - Largely valid as adaptation is more important than mitigation due to greater effectiveness of adaptation strategies in managing effects of climate change in most circumstances (e.g. adaptation is able to immediately address effects as compared to mitigation)
        - Largely invalid mitigation is more important than adaptation due to greater effectiveness of mitigation strategies in managing effects of climate change (e.g. unlike adaptation, mitigation is able to address the root cause of climate change)
        - Somewhat invalid as neither is more important than the other or both are equally important as the relative importance depends on contextual factors (e.g. level of development of the country, etc.)

- Candidates should **consistently** compare the importance of adaptation relative to mitigation in the essay, using criteria such as:
    - Spatial scale at which climate change effects are addressed (e.g. is the response applicable globally, regionally and/or nationally? is the response able to address locally-experienced effects of climate change?)
    - Temporal scale at which climate change effects are addressed (e.g. is it a long-lasting response to climate change? does it immediately address climate change effects experienced by a particular group of people?)
    - Addressing the root cause of climate change
    - Feasibility of strategy (e.g. is it financially feasible for countries to implement? are the trade-offs when the strategy is implemented acceptable?)

- Consideration of whether adaptation is more important could also take into account the **context** of the country to determine what makes a strategy **more or less important than another** – e.g. level of development, exposure to climate change effects, etc. – with the understanding that the idea of "importance" could differ based on context

Levels marked using Generic Level Descriptors for 20m H2 essays.