

Date: 7 March 2025

Our Ref: P76.020.002

WHO SHOULD KNOW:

Developers, Registered Architects, Professional Engineers, and Transport Consultants making Transport Impact Assessment (TIA) submissions to LTA.

Dear Sir / Madam

CORENET X SUBMISSION AND APPROVAL PROCESS FOR TRANSPORT IMPACT ASSESSMENTS (TIA)

OBJECTIVE

1. The Land Transport Authority (LTA) would like to inform of the submission and approval process for Transport Impact Assessments (TIAs) via CORENET X with immediate effect.

BACKGROUND

2. LTA's TIA Guidelines provide a general approach on whether a TIA is required. The key objective of the TIA is to assist in optimal planning and designing of the internal layout of the development and surrounding transport network to better cater to the travel needs of users of the proposed development.
3. To date, less than 0.5% of developments require a TIA. TIAs are typically imposed on developments involving (a) mixed uses, (b) proposed uses that are non-typical, (c) located in traffic sensitive areas, or (d) first movers of new development areas.
4. Since 2022, LTA has been rolling out initiatives to continuously improve the TIA process. These included the introduction of the TIA Consultant Registration scheme, providing more clarity to the TIA guidelines and conducting courses for TIA Consultants, Developers and Architects. These initiatives have raised awareness and kept TIA Consultants regularly updated of LTA's requirements.

TIA PROCESS UNDER CORENET X

5. Currently, for developments where TIAs are required, QPs/Transport Consultants are to obtain TIA approval before Development Control (DC) approval can be granted. With submissions via CORENET X¹, the TIA submission and approval process will involve two parts, i.e. part one approval to be obtained before the Design Gateway (DG) stage and part two approval before the Construction Gateway (CG) stage. This is to shorten the time to obtain TIA approvals taking into consideration feedback that LTA received through the engagement with TIA Consultants, Developers and Architects. The updated process also clearly states the items required for clearances at the respective stages of CORENET X.

¹ TIA submissions will continue to be made via CORENET 2, if your development is not submitting under CORENET X.

6. TIA Consultants may refer to Annex A for the details of the updated submission and approval process.

EXPECTED BENEFITS TO THE INDUSTRY

7. This TIA submission and approval process is expected to bring about the following benefits:
 - a. Provide clear details and items required for TIA submissions as part of the CORENET X Gateway processes. This will also lead to a reduction in the number of iterations needed, resulting in fewer revisions and re-submissions.
 - b. Overall, the industry can look forward to time and cost savings, and a more productive use of resources.

CLARIFICATIONS ON TIA

8. Developers, Architects and TIA Consultants may refer to Annex B for clarifications relating to TIAs. This was shared at the focus group discussion held on 7 November 2024. In addition, please refer to Annex C for the deck of slides that was shared at the 10th Transport Infrastructure Collaboration Panel (TICP) held on 15 Nov 2024.

ENQUIRIES

9. We would appreciate if you could convey the contents of this circular to members of your organisation. Should you have any queries, you may contact us at LTA_TIA_registration@lta.gov.sg

Thank you.

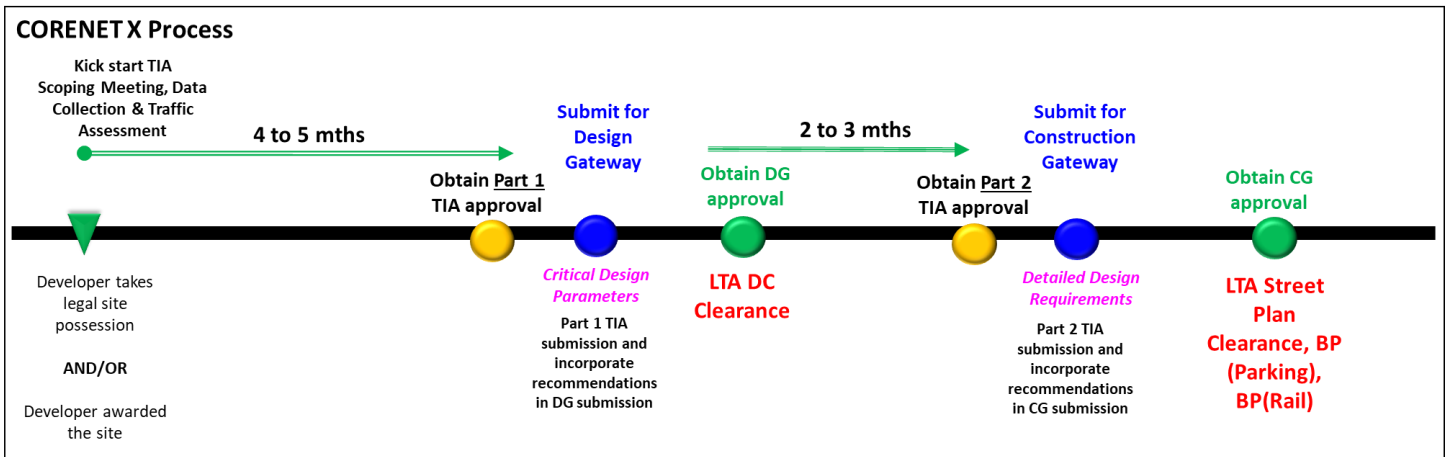
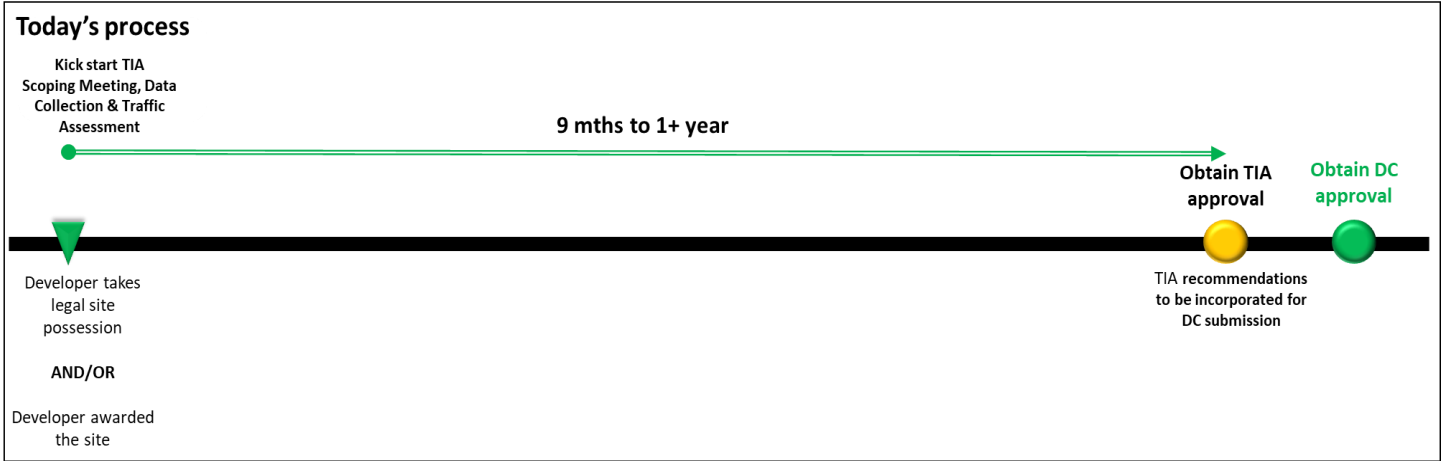
Yours Sincerely,



Wang Yean-Mei
2 Director, Local Planning
Policy & Planning Group

ANNEX A – THE CORENET X TIA PROCESS

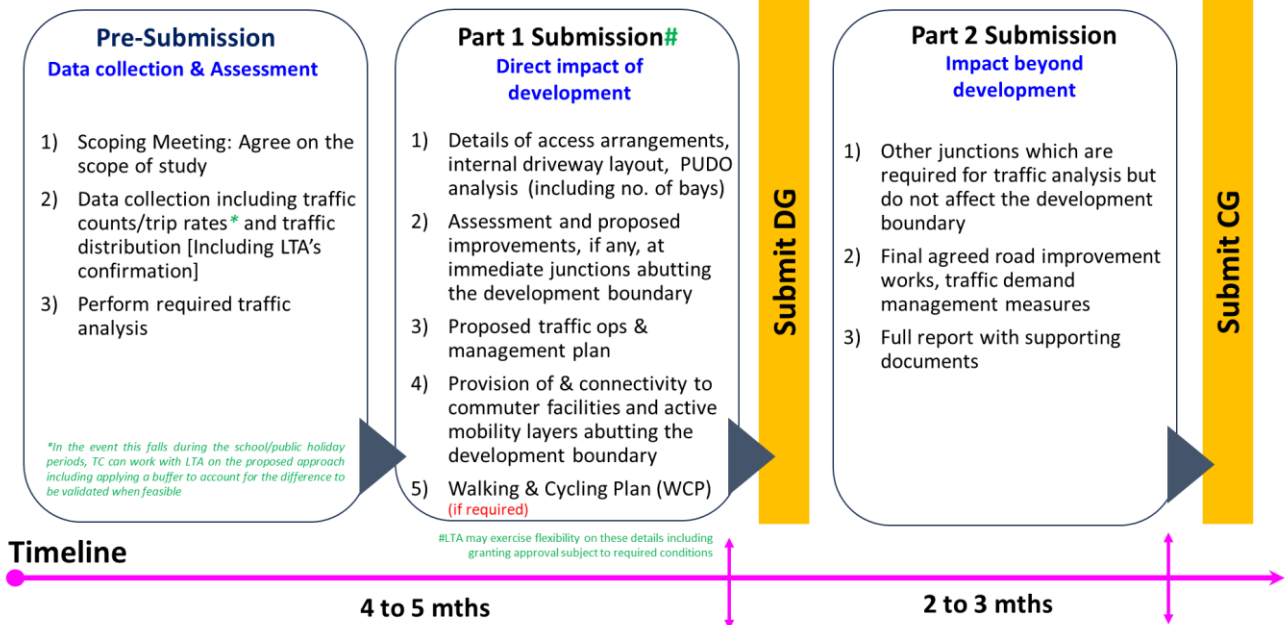
COMPARISON BETWEEN THE CURRENT PROCESS WITH THE CORENET X PROCESS



REQUIREMENTS OF THE TIA SUBMISSION UNDER THE CORENET X PROCESS

TABLE 1

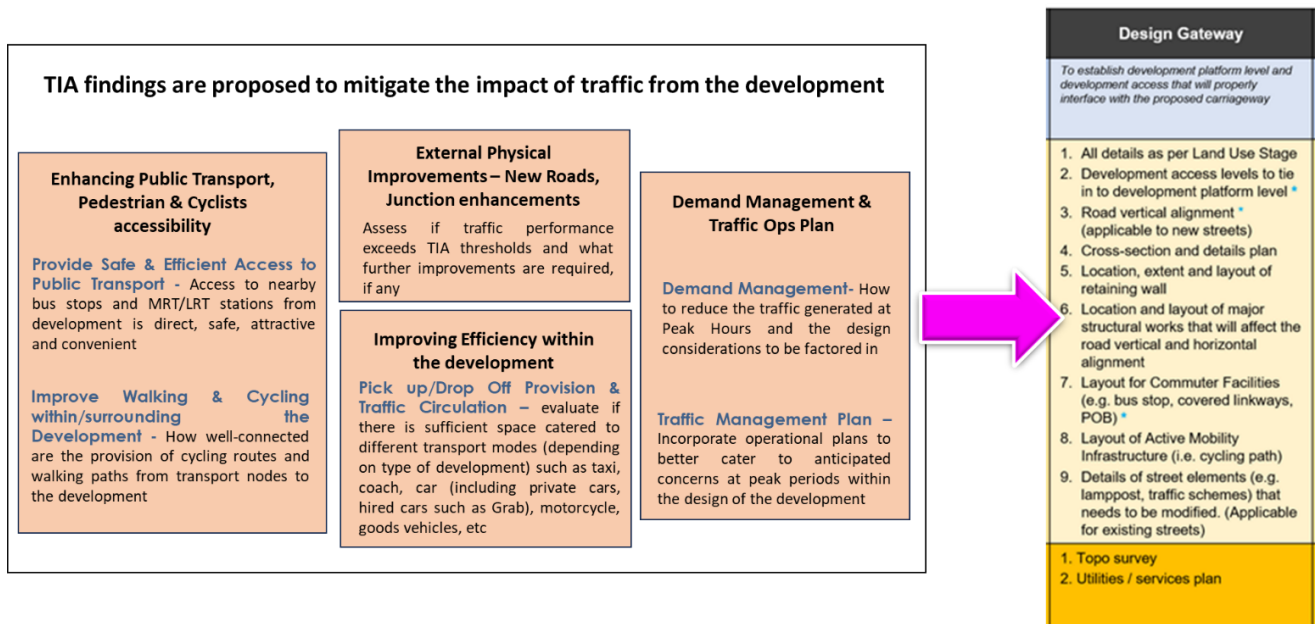
LTA to grant approvals in 2 stages to facilitate submissions via CORENET X platform



Note: Developers/TIA consultants should start TIAs early to ensure that Part 1 TIA approval is obtained before submission for Design Gateway (DG).

TABLE 2

To prevent abortive work and ensure transport is well taken care of, it is important that the TIA outcomes are completed before DG submission



ANNEX B – FREQUENTLY ASKED QUESTIONS & ANSWERS ON TIA

Q1: What are the benefits of the TIA?

A: The objective of a TIA is to allow early identification of potential provision/design issues, to avoid/minimise expensive remedial actions. The TIA outcomes will assist in more optimal planning and designing of the internal layout of the development and surrounding transport network to better cater to the travel needs of the proposed development(s).

There is no one size fits all design. The TIA outcomes are meant to address specific nature/needs of the development and to enhance the accessibility, connectivity and convenience to active and mass transport.

Q2: Why does LTA need TIAs to be done since LTA has already made the assessment and determined the improvements that would be required. Instead, can LTA impose the requirements on developers directly as part of tender conditions?

A: For approval of land for development, e.g. Government Land Sales (GLS), only broad parameters are available at the planning stage which LTA takes on in its assessment. The requirements that are necessary are then imposed in the Technical Conditions Of Tender (TCOT).

At the stage when such sites are awarded and developers are on board, more details will then be available as the design is further developed. LTA needs the TIA to be done taking on these new details. These typically focus on areas where pick up/drop off is done, how connectivity to public transport encourages more Walk, Cycle, Ride (WCR), immediate junction improvements, traffic management measures, etc, which are specifically designed to cater to the development's needs.

Q3: What are some of the improvements that LTA has done to help quicken approval timelines?

A: With the refinements that were rolled out since 2020, we have seen progress and improvements in the quality and duration of the TIA. In the Jan 2020 Addendum to Transport Impact Assessment Guidelines for Developers, greater clarity was provided in the scope of work and target duration.

The roll out of the TIA Registration Scheme in June 2022 further helped to improve the quality of the TIA submissions.

Q4: How do I know if my development needs a TIA?

A: The need and type of TIA, if required, will be clearly stated upfront in the Technical Conditions Of Tender (TCOT) of Government Land Sales (GLS) Tender Document.

Q5: For new projects outside of CORENET X, can I submit the TIA in two parts?

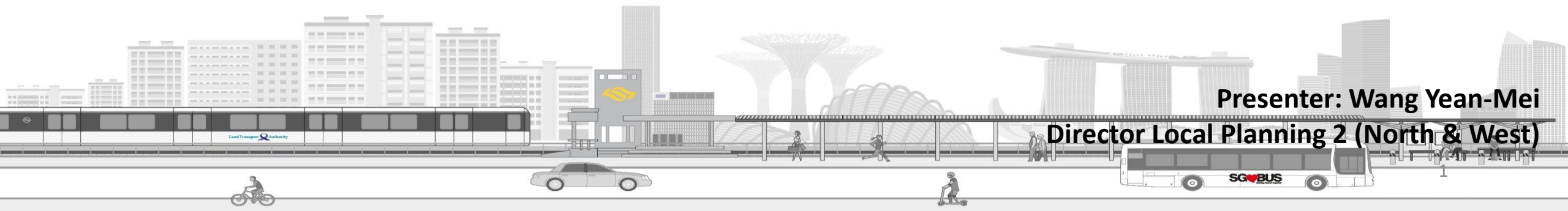
Yes, LTA will process TIA submissions in two parts so long as the requirements stated in each part are fully incorporated. However, for better clarity, the requirements for the respective parts can be agreed on at scoping meetings.

Update on salient points raised at the industry engagement held on 7 Nov 2024

TICP Co-Creation Series

Enhancements to the TIA submission and evaluation process to facilitate
CORENETX transition

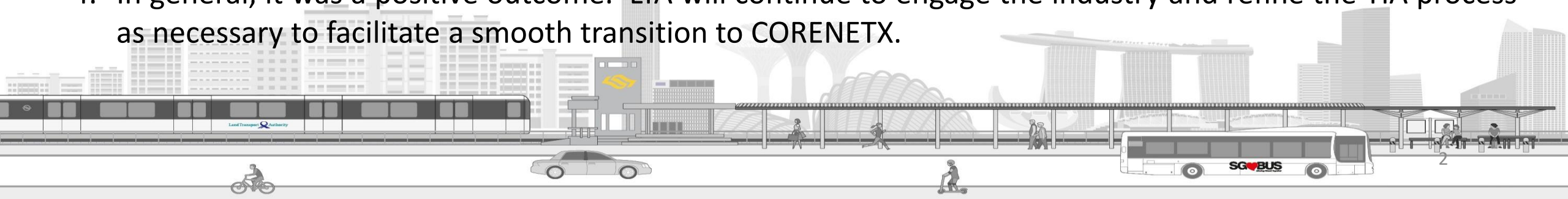
15 Nov 2024



Presenter: Wang Yean-Mei
Director Local Planning 2 (North & West)

Context

1. At the 19 Sept 2024 TAC meeting, LTA presented on the 2-stage approval process for TIAs to better facilitate submissions via the CORENETX platform.
2. Given concerns on the feasibility and practicality of the process, LTA engaged industry practitioners on 7 Nov 2024. The session was facilitated by GDPP Lina Lim. Invited attendees included Developers, Architects and Traffic Consultants (refer to **Annex** for the list of attendees).
3. The outline of the engagement was as follows.
 - Set the context for the need of TIAs through deconstructing and clarifying the facts in relation to some of the myths of TIAs with an update on enhancements made to the TIA process thus far
 - Shared a snapshot of upcoming reviews that LTA will conduct to continue to improve the TIA process
 - Shared more details on the proposed 2-stage approach for TIA submission via the CORENETX Platform
4. In general, it was a positive outcome. LTA will continue to engage the industry and refine the TIA process as necessary to facilitate a smooth transition to CORENETX.



Deconstructing the 'myths' of TIA



Myth 1: “TIA is imposed on ALL developments”

TIA's are typically imposed on developments involving **(a) mixed uses**, proposed uses that are **(b) non-typical**, **(c) located in traffic sensitive areas**, or **(d) first movers of large, planned developments**.



Myth 2: “TIA is imposed by LTA to add more work for developers”

LTA's TIA Guidelines (*Transport Impact Assessment – Guidelines for Developments, Annex A*) provides a general guide on whether a TIA is required. In addition, the **need & type** of TIA, if required, will be clearly stated upfront in the TCOT of GLS sites.

A TIA is **not required** for most developments – less than ~ 0.5%* of developments require a TIA.

Myth 3: “Why does LTA need TIA's to be done since LTA has already made the assessment and determined what improvements would be required. Instead, LTA should simply impose the requirements on developers directly”

For approval of land for development, e.g. GLS, **only broad parameters are available at the planning stage** which LTA takes on in its assessment. The requirements that are necessary are then imposed in the TCOT.

At the stage when such sites are awarded and developers are on board, more details are then available as concepts become reality. LTA needs **the TIA to be done taking on these new details**. These typically focus on areas where pick up/drop off is done, how connectivity to public transport encourages more WCR, immediate junction improvements, traffic management measures, etc, which are **specifically designed to cater to the development needs**.

Deconstructing the ‘myths’ of TIA



Myth 4: “How does the TIA benefit me (Developer) ”

The objective of a TIA is to allow early identification of potential provision/design issues, **avoid/minimise expensive remedial actions.**

Assist in more **optimal planning and designing** of the internal layout of the development and transport network to better cater to the travel needs of the proposed development(s).

There is no one size fits all design. The TIA outcomes are meant specifically for the nature/needs of the development and **maximize the accessibility, connectivity & convenience to active and mass transport.**



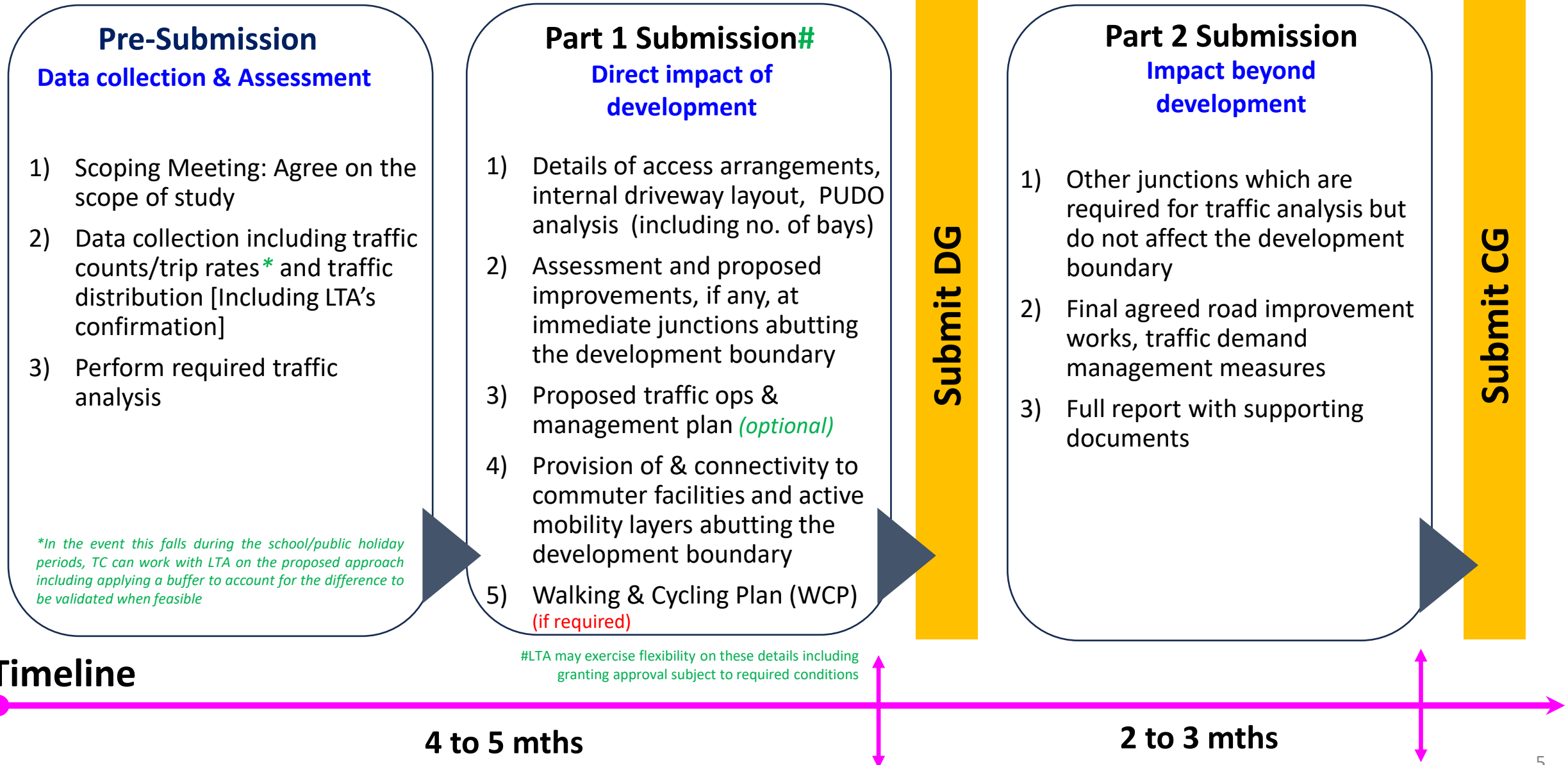
Myth 5: “TIA is cumbersome and a long drawn process”

With the **refinements** that we rolled out since 2020, we have seen progress and improvements in the quality and duration of the TIA.

In the Jan 2020 Addendum to Transport Impact Assessment Guidelines for Developers, greater clarity was provided in the scope of work and target duration.

The roll out of the TIA Registration Scheme in June 2022 further helped to improve the quality of the TIA submissions.

Proposed **refinements** agreeable by LTA to grant approvals in 2 stages to facilitate submissions via the CORENETX platform



Salient points from the engagement with the industry

1. General TIA feedback/comments

No.	Comments/Feedback	Suggestions
a.	The group acknowledged that TIAs are imposed on <u>a small number</u> of developments submitted to LTA (~ 0.5%).	For industry attendees to <u>share LTA's clarifications</u> on the facts in relation to the "myths" regarding TIA with their organisation and members of the TACs.
b.	<p>Industry members appreciated that LTA has provided greater clarity on the need and the scope of TIAs for GLS sites. However, they were <u>not as clear on what constitutes a traffic sensitive area</u>. LTA responded that Developers/Architects/Transport Consultants (TC) are welcome to pre-consult LTA at any point of time on this.</p> <p>LTA also recapped that for sites involving en-bloc redevelopments, there was also the <u>Pre-Application Feasibility Study (PAFS) process</u> established since 2017 which building owners, developers, architects, real estate agencies and transport consultants should <u>consult LTA in advance to understand the requirements</u>.</p>	<p>LTA will emphasise the <u>availability of existing pre-consultation channels</u> to better support developers, architects and TCs on their queries on TIAs.</p> <p>Nonetheless, LTA will <u>review and provide better clarity</u> through our TIA guidelines.</p>
c.	<p>Developers/Architects requested for <u>TCs to ensure that they are well versed and updated on LTA's requirements</u>. This is important as it enables TCs to provide the necessary traffic analysis to obtain approvals of the TIA within the stipulated duration.</p> <p>They are also of the view that when <u>TCs have direct contact with LTA OICs</u>, it would better facilitate quick discussions when in doubt and/or arrangement of meetings as necessary.</p>	LTA will continue to <u>conduct regular courses</u> to update the TCs on our requirements.



Salient points from the engagement with the industry

2. Feedback on the 2-stage approval approach for TIA

The group was generally supportive of the 2-stage approval proposal but highlighted some issues/concerns and provided suggestions to better refine the process:

No.	Comments / Feedback	Suggestions
Developers/Architects		
a.	<p>The projected duration of 4-5 months to obtain approval for part 1 TIA submission is too long given that they would have already developed the conceptual design and be ready to submit for DG in 2-3 months.</p> <p>The concern raised was the fact that the DG submission approval process alone would require about 4-5 months hence adding this pre-DG TIA of a possible further 4-5 months would impact the overall timeline.</p>	<p>LTA could consider more flexibility in granting approval/conditional approval should the TIA not be able to provide the required submission items listed.</p> <p>However, the key red lines and conditions which would impact the development design should be highlighted as part of DG stage comments to ensure that these comments are captured and followed up at CG for compliance.</p> <p>The conditional approval would allow the Architects to submit to the DG stage, but all comments/requirements must be followed up as part of CG. The Architects/Developers would bear some risk if they choose to adopt this approach to still proceed with CG based on DG conditional approval.</p>
b.	<p>For a typical TIA, the traffic counts can only be conducted during non-school/non-public holidays. This would result in loss of time if the sale site was awarded at these periods.</p>	<p>Some TCs have already been working with LTA on an appropriate buffer to be considered to the base traffic counts if such counts are to be collected during the school holidays/public holidays, and for a validation count to be done after school/public holidays has ended to calibrate the buffer and assumptions accordingly.</p>



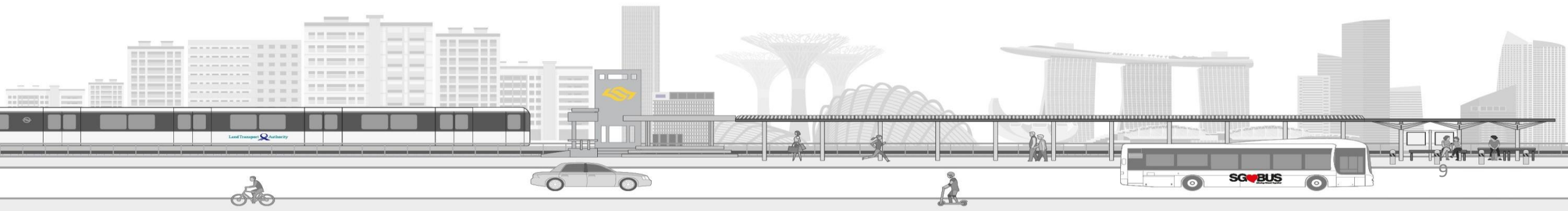
Key Salient points from the engagement with the industry

2. Feedback on the 2-stage approval approach for TIA (cont)

No.	Comments/Feedback	Suggestions
Transport Consultants		
a.	TCs commented that they are typically engaged by Developers/Architects at the later stages and hence was unable to contribute to the design process early and also achieve the intended outcome of the TIA as the design would have been at an advanced stage or firmed up. This will result in lengthy discussions on how to ensure the TIA recommendations can still be implemented.	<p>For GLS sites, given that the need and type of TIA is made known in the tender conditions, the Developers should engage TCs from the start and ensure that the TC works closely with Architect.</p> <p>For other cases, Developers/Architects are encouraged to check in with LTA early. This is important as it will then enable sufficient time for the necessary findings by the TC to be incorporated prior to the design being committed.</p>
b.	Although the TIA could show that there may be improvement works required at junctions away from the development frontage to support their development, Developers tend not to agree to implement these improvements.	Developers should be responsible to implement physical improvements should it be deemed necessary as part of the TIA. Alternatively, there are other less costly measures beyond physical improvements which can be considered by the developer to better manage the traffic impact.
c.	Developer make changes to the development parameters (e.g. GFA, use type) and designs which leads to the need to re-run the traffic analysis, etc.	<p>Developers/Architects should minimize such occurrences. This is important to prevent abortive work /re-runs of analysis, etc hence impacting the timeline.</p> <p>This is less likely to happen as the objective of CORENETX is to ensure that parameters are firmed up at DG stage.</p>
d.	LTA takes too long to set up TIA scoping meetings .	<p>There is currently a checklist/form readily available at Annex B of LTA's TIA Guidelines, which TC should work with Developers/Architects to complete and submit it to LTA OIC together with the request to arrange for a scoping meeting.</p> <p>If the above information provided is complete, a meeting will be set up within 2 weeks. LTA has been facilitating scoping meetings to be held via online channels and physical meetings, whichever is more expedient and suitable for the subject case.</p> <p>LTA has also been working with TCs to agree on junctions to survey first via email, before the actual scoping meeting takes place. This would allow the TC to plan and deploy manpower for these surveys ahead of the scoping meeting.</p>

Questions & Answers

Thank you



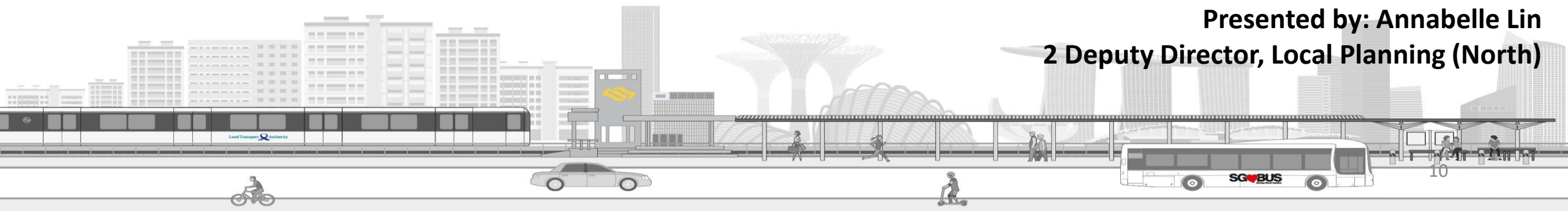
This deck of slides is
taken as read

TICP Co-Creation Series

Enhancements to the TIA submission and evaluation process to facilitate CORENETX transition

7 Nov 2024

Presented by: Annabelle Lin
2 Deputy Director, Local Planning (North)



Key Objective

The submission of a Transport Impact Assessment (TIA) via CORENETX will be necessary if a development is deemed to require a TIA to be done. To facilitate a smooth transition to CORENETX and support industry partners, we would like to share and seek your inputs on the proposed enhancements relating to the TIA submission and approval process.

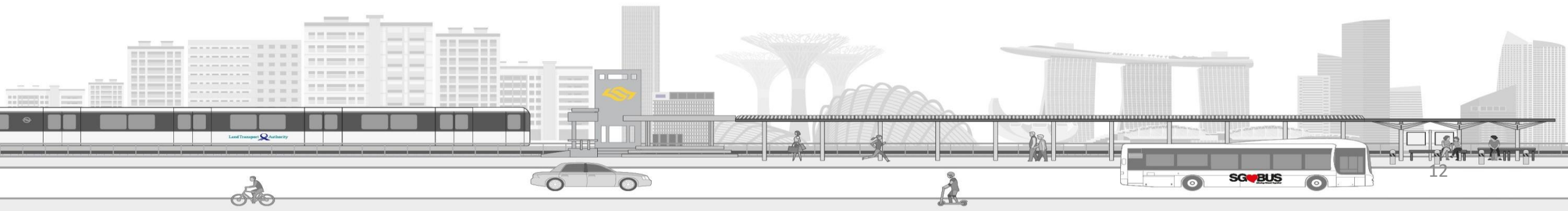
TIAs take time. How will this affect my submission via CORENETX?

Can concurrent submissions be feasible and if so, what are the TIA aspects that need to be firmed up for this to be possible?

At what stage can the findings/ recommendations of the TIA be ported into DG submissions (so that DG and TIA can proceed concurrently)?

Outline

1. Update on the enhancements made to the TIA process
2. Overview of upcoming reviews that LTA will conduct to continue to improve the TIA process
3. Share the proposed 2 – stage approach for TIA submissions via the CORENETX platform



✘ Myths of Transport Impact Assessments (TIAs)

Myth 1: “TIA is being imposed on ALL developments”



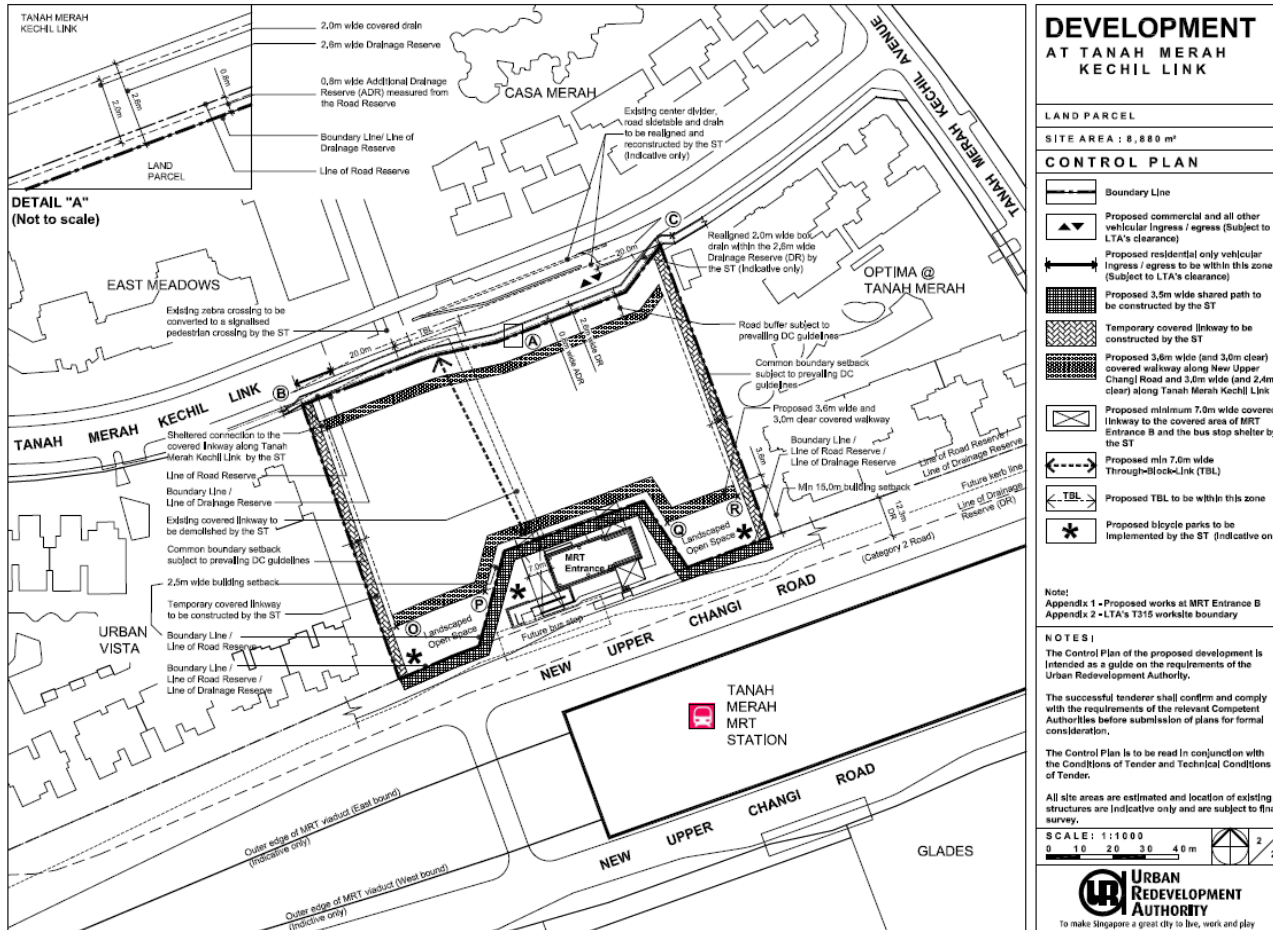
TIAs are typically imposed on developments involving **(a) mixed uses**, proposed uses that are of **(b) non-typical uses**, **(c) sited in traffic sensitive areas**, or **(d) first movers of large, planned developments**.

Examples include :

Mixed use	<ul style="list-style-type: none">Proposed Mixed-use Development consisting of commercial/residential (~1,193 DUs) integrated with a bus interchange, community club & hawker centre at Tampines Ave 11Proposed Integrated Transport Hub with mixed residential and commercial development at Sengkang Central
Non- typical	<ul style="list-style-type: none">Marina Bay Sands 2Expansion of Dulwich College (Singapore) – Foreign System School
Sited in traffic sensitive areas	<ul style="list-style-type: none">URA GLS site along Tanah Merah Kechil Link (Residential 268 DUs with 1st storey commercial)

TIA that was imposed despite not meeting threshold as it is located within a traffic sensitive area, i.e. persistent feedback

Example: URA GLS site for residential with 1st storey commercial



Residential : 268 DUs [requirements >700 DUs]
Commercial : 2000sqm (including 1000sqm supermarket) [requirements >10,000sqm GFA]

Persistent feedback from Advisers on the traffic impact arising from several URA GLS sites launched in the Tanah Merah/Bedok Rise area in the past few years, which is in the vicinity of this GLS site at Tanah Merah Kechil Link.

The TIA conducted by a Transport Consultant had identified improvement works based on the type of commercial uses (e.g. F&B, shops, supermarket, etc) and the number/type of DUs (e.g. room mix) being proposed.

✘ Myths of Transport Impact Assessment (TIA)

Myth 2: “TIA is being imposed by LTA to add more work for developers”



LTA’s TIA Guidelines (*Transport Impact Assessment – Guidelines for Developments, Annex A*) provides a general guide to whether a TIA is required. In addition, the **need & type** of TIA, if required, will be clearly stated upfront in the TCOT.

A TIA is **not required** for most developments – less than ~ 0.5%* of developments require a TIA.

Example of developments that met the Guideline criteria but LTA did not impose a TIA:

1. Redevelopment of Tanglin Shopping Centre @ 30,594sqm
2. Executive Condo E14 GLS (Pte resi) at Tampines St 86 with 700 DUs
3. Industrial developments, SJ Campus @ ~69,000 sqm GFA & Hyundai @ ~90,000 sqm GFA

ANNEX A – Conditions When a Transport Impact Assessment (TIA) is Required

A TIA and WCP are required to be prepared prior to the Development Control stage if one or more of the conditions specified in the following table apply to the development. However, if other specific developments are expected to generate high pedestrian and cyclist volume, the LTA will advise the applicant on whether a WCP is required.

Development Type	Scale
1. Residential	
1.1.Landed properties/ Condominiums/ Executive Condominiums	≥ 700 units
1.2.HDB housing ¹¹	≥ 1,000 units
2. Commercial	
2.1.Shopping centres/ Retail uses	≥ 10,000m2 GFA
2.2.Office development	≥ 20,000m2 GFA
2.3.Hotel	≥ 700 rooms
3. Industrial	
3.1.Light/ General Industry ¹²	≥ 60,000m2 GFA
3.2.Warehousing/ Distribution ¹²	≥ 50,000m2 GFA
3.3.Science park/ High tech park/ Business park	≥ 40,000m2 GFA
4. Educational	
4.1.Primary school	≥ 1,500 students (single-session) or. ≥ 2,000 students (double-session)
4.2.Secondary school	≥ 2,000 students
4.3.International school	≥ 2,000 students
4.4.Junior college	≥ 2,000 students
4.5.University, polytechnic, ITE campus	TIA Required
5. Medical	
Hospital	≥ 40,000m2 GFA or ≥ 320 Beds (whichever is triggered)
6. Recreational	
Exhibition centre & major tourist attraction	≥ 30,000m2 GFA

Figure A.1 – TIA & WCP requirements

*LTA processes submissions of ~ 3000 unique projects per year

Example: Executive Condo E14 GLS at Tampines St 86 (Private Residential Development – Parc Central Residences)



Use	Proposed Development
Residential	700 DUs

Parc Central Residences meets the TIA guidelines criteria of ≥ 700 DUs for Condo. **HDB had conducted an district-level TIA** for the entire area bounded by Tampines Ave 1/8/5/10 which accounted for all the 10 residential parcels, including this EC development and the required road improvement works were already implemented by HDB. Hence, it would not be necessary to have the private developer carry out TIA study at the development level since there are **no significant deviation to the number of DUs and access point location from what was previously studied.**

Myths of Transport Impact Assessment (TIA)

Myth 3: “Why does LTA need TIAs to be done since LTA has already made the assessment and determined what improvements would be required. Instead, LTA should simply impose the requirements on developers directly”



For approval of land for development, e.g. GLS, **only broad parameters are available at the planning stage** which LTA takes on in its assessment. The requirements that are necessary are then imposed in the TCOT.

At the next stage when these sites are awarded and developers are on board, more details are then available as concepts become reality. LTA needs **the TIA to be done taking on these new details**. These typically focus on areas where pick up/drop off is done, how connectivity to public transport encourages more WCR, immediate junction improvements, traffic management measures, etc, which are **specifically designed to cater to the development needs**.

Detailed breakdown of uses/quantum/trip generation information for Development TIA after the developer/QP is on board

Example: Sengkang Grand Mall & Residences

- LTA assessed based on broad parameters as specified in TCOT
- Developer had the flexibility to propose the mix of commercial uses at development stage

Permissible Gross Floor Area (GFA)	<p>Maximum GFA: 78,299 m² Minimum GFA: 70,469 m²</p> <p>At least 46,980 m² GFA shall be for residential use.</p> <p>Of the remaining GFA:-</p> <p>a Minimum 6,000 m² shall be for Community Club; b Minimum 3,300 m² shall be for Hawker Centre; c Minimum 3,315 m² shall be for Bus Interchange (inclusive of a minimum 215 m² for Shop and Restaurant use); and d Minimum 1,000 m² shall be for Child Care Centre</p> <p>Rest of the remaining GFA [excluding all GFA for the uses stated from (a) to (d) above] may be for commercial use.</p> <p>Not more than 12,000 m² of the remaining GFA shall be for the following uses ("retail"):</p> <p>a Shop and Restaurant uses (including such uses within the Bus Interchange, Hawker Centre and any Outdoor Refreshment Areas); b Medical Clinics; and c Other commercial (excluding office and commercial school) uses such as those for bar/pub, sports and recreation, amusement centre, etc. if permitted by the Competent Authority under the Planning Act (Cap. 232).</p> <p>The detailed requirements are in Conditions 4.2.</p>
------------------------------------	---

- Detailed breakdown of commercial uses and quantum only available after developer/consultants were on board and adopted in the TIA study

Proposed Overall GFA (sqm)	84,145.71 sqm (Plot Ratio: 2.2586)
Components	Residential : 680 Units
	▪ 1-room : 131 Units
	▪ 2-room : 241 Units
	▪ 3-room : 259 Units
	▪ 4-room : 49 Units
	Commercial/Community/Bus Interchange : 27,486.00 sqm
	▪ Shop : 3,624.61 sqm
	▪ Restaurant : 1,957.53 sqm
	▪ Supermarket : 1,495.00 sqm
	▪ Commercial School : 1,835.45 sqm
▪ Hawker Centre : 3,300.00 sqm	
▪ Community Club* : 6,000.00 sqm	
▪ Childcare Centre : 1,000.00 sqm	
▪ Bus Interchange : 3,315.00 sqm	
▪ Others (M&E, Lobby/Corridors/Staircases) : 4,958.41 sqm	
(*includes PA childcare centre – 1,000 sqm)	

Myths of Transport Impact Assessment (TIA)

Myth 4: “How does it benefit me (Developer) ”



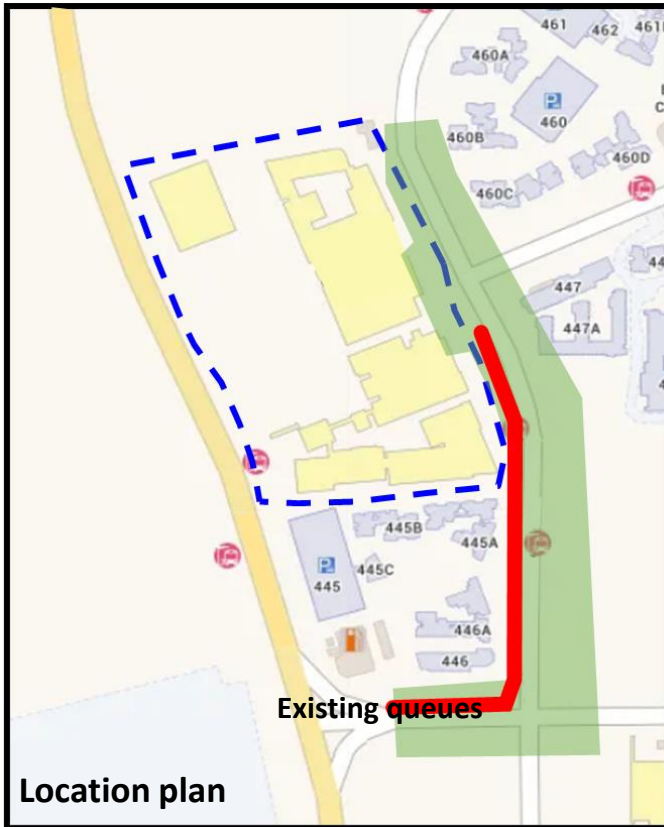
The objective of a TIA is to allow early identification of potential provision/design issues, **avoid/minimise expensive remedial actions.**

Assist in more **optimal planning and designing** of the internal layout of the development and transport network to better cater to the travel needs of the proposed development(s).

There is no one size fits all design. The TIA outcomes are meant specifically for the nature/needs of the development and **maximize the accessibility, connectivity & convenience to active and mass transport.**

How TIA has facilitated the re-design of internal layout of developments to make it more efficient and minimize impact to surrounding residents

Example: Expansion of Dulwich College (Singapore) @ Bukit Batok Type 2 TIA (Micro-simulation)



Existing international school with prevailing traffic issues proposed an A&A – build 1 additional block with increased student population – 2,500 to 3,000 students

Objective of the TIA was to address current issues and study the impact and required improvements with the increase in student population

Recommendations from the TIA:

A. Physical Improvements:

- Reconfiguration of main entrance to 2 lanes.
- Construction of storage lane at main entrance to better facilitate traffic flow.

B. Soft Measures:

- Windscreen decals for parents' cars for easy identification – faster security clearance
- Adjustment to mid-block crossing timing to flush through more school traffic during the AM peak
- Traffic marshal to control flow of pedestrians crossing the main vehicular access



How TIA has shaped the internal layout and provided sufficient space for the PUDOs

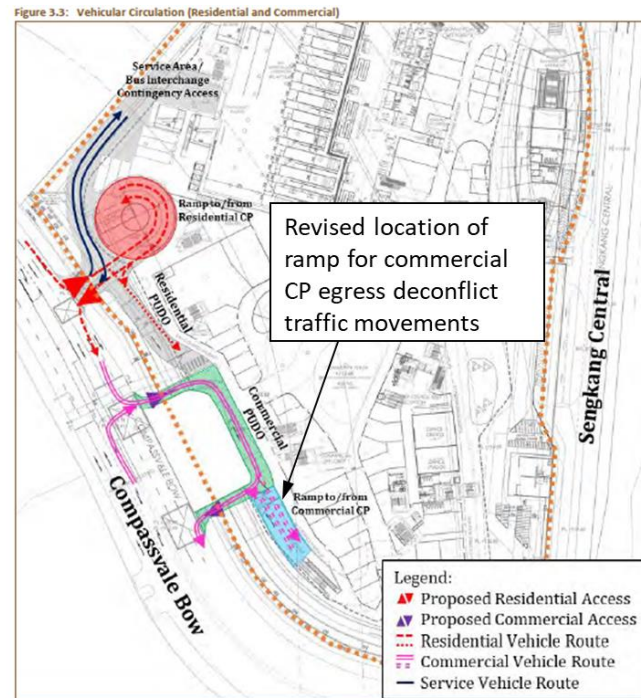
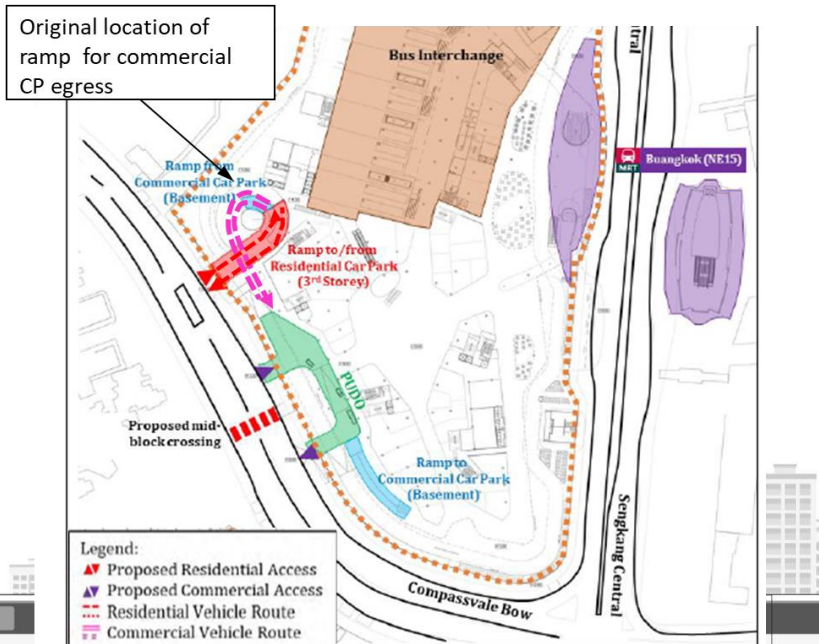
Example: Sengkang Grand Mall & Residences

Type 1 TIA

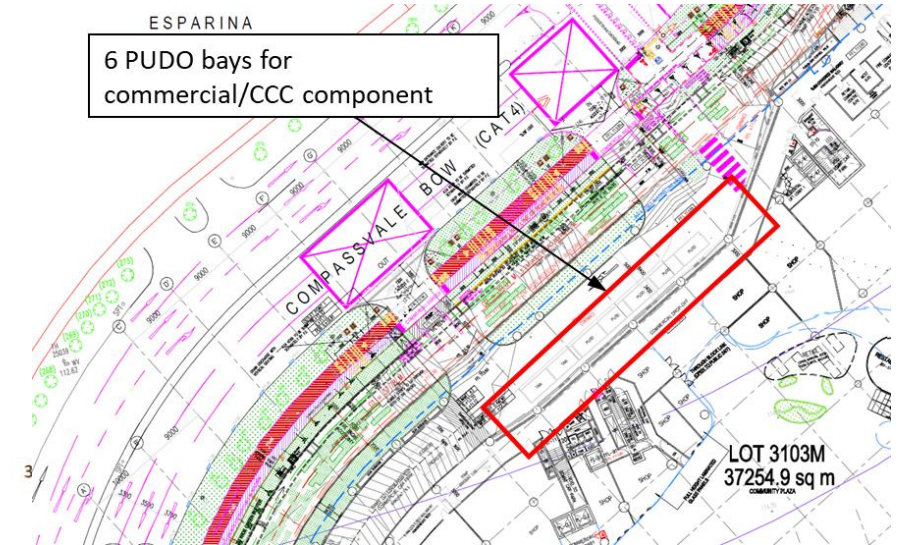
1 Internal layout and traffic circulation were adjusted and improved based on Development TIA findings at early project design stage

Original layout prior to Development TIA : location of car park ramp leading to vehicular conflicts

Improved layout after TIA : revised ramp location for car park access to deconflict with other traffic movements



2 Provision of queue space, PUDO bays, etc are assessed at TIA stage in conjunction with QP's design proposal



3.4.1 Queuing assessment was carried out to ensure that the pick-up/drop-off point for the development is adequately designed without vehicles queueing on the public road. Based on the traffic survey, the total number of pick-up/drop-off vehicles expected for the commercial components (including childcare centre) and the average dwell time is as follows:

Number of PUDO vehicles

AM:

Commercial	: 36 veh/hr
Childcare centre	: 57 veh/hr (65% were observed to drop-off at the PUDO point of reference site)

PM:

Commercial	: 73 veh/hr
Childcare centre	: 36 veh/hr (45% were observed to pick-up at the PUDO point of reference site)

Average Dwell Time

Commercial	: 24s (drop-off/pick-up)
Childcare Centre	: 34s (drop-off), 22s (pick-up)

3.4.2 The following calculations depict the queuing assessment based upon the first principle queuing theory. Due to the difference in number of PUDO traffic and its dwell time of commercial and childcare centre, weighted dwell time is used and calculated as follow:

$$\text{AM: } [(36 \text{ veh} \times 24\text{s}) + (57 \text{ veh} \times 34\text{s})] / 93 \text{ veh} = 30.1 \text{ s}$$

$$\text{PM: } [(73 \text{ veh} \times 24\text{s}) + (36 \text{ veh} \times 22\text{s})] / 109 \text{ veh} = 23.3 \text{ s}$$

In total there are at least 6 bays for vehicles to pick-up/drop-off simultaneously. It is also expected that 40% of peak hour total traffic will arrive within a 15-min peak period as observed at other commercial development.

✘ Myths of Transport Impact Assessment (TIA)

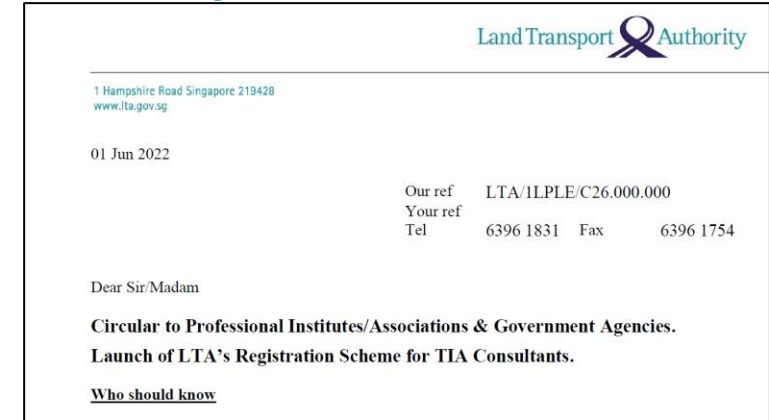
Myth 5: “TIA is cumbersome and a long drawn process”



With the **refinements** that we rolled out since 2020, we have seen progress and improvements in the quality and duration of the TIA.

In the Jan 2020 Addendum to Transport Impact Assessment Guidelines for Developers, greater clarity was provided in the scope of work and target duration.

The roll out of the TIA Registration Scheme in June 2022 further helped to improve the quality of the TIA submissions.



TIA Classification	Description
Type 1 Typical Single Development Duration: 6 months	<ul style="list-style-type: none"> • ≤ 5 junctions • Junction analysis with SIDRA software • Typically for single development TIA • Generally 3 months to prepare and submit TIA report • Target generally around 3 reviews or 3 months to close the TIA
Type 2 Big Single Development OR District Level Duration: 8 months	<ul style="list-style-type: none"> • > 5 junctions. Generally not exceeding 12 junctions • Junction analysis with SIDRA software and / or with micro-simulation • Single development or district level development TIA • Generally 3 months to prepare and submit TIA report • Target generally around 4 reviews or 4 months to close the TIA
Type 3 District Level OR Region (master plan) Duration: 12 months	<ul style="list-style-type: none"> • > 12 junctions. • Junction analysis with SIDRA software, with high-level demand modelling and / or with micro-simulation • Typically for large district level or Masterplan TIA • Generally 6 months to prepare and submit TIA report • Target generally around 4 reviews or 6 months to close the TIA

Extracted from the Jan 2020 Addendum

Refinements and improvements to the TIA process since 2020

Further Streamlining of TIA process & guidelines

- Classification of TIA to allow greater clarity of scope (refer to TCOT)
- Greater clarity on the report submission practice & process
- Setting a timeline on the response time by both Consultants & LTA (not more than 3 submissions and responses)
- Sharing of datasets with the industry such as Junction Counts, Development Trip Rates to shorten time taken in data collection (since Feb 2023)

Raising awareness for the Industry

- Conducted the inaugural course - Awareness of TIA for Developers & Architects in Aug 2023

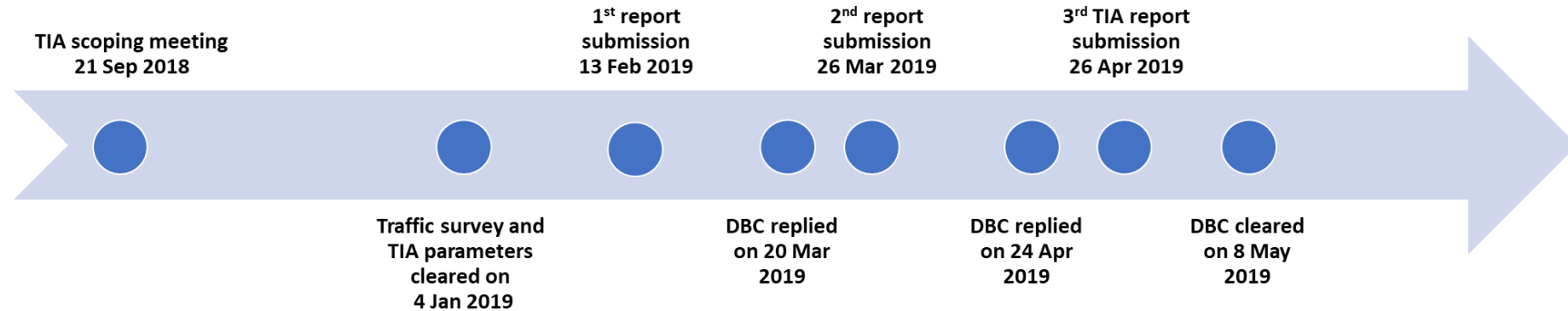
Better quality of TCs

- Registration Scheme for Consultants (Jul 2022) – See list
 - Recognise TIA consultants who can produce quality TIA reports/work and complete the TIA within acceptable duration
 - Filter out consultants who provide poor quality work and provide feedback for them to improve
- Upskilling the capability and understanding of consultants on LTA's requirements through courses, workshops – conducted
 - Inaugural run was held on Oct 2022 and attended by 17 participants

There have been improvements both in terms of the quality and duration of TIAs over the years

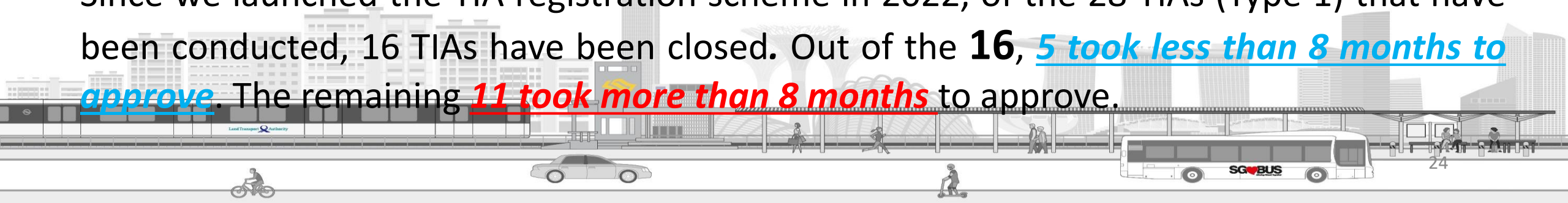
Example 1: Sengkang Grand Mall & Residences

~ 4 months from first TIA report submission to LTA's final clearance. If counting from date of TIA scoping meeting, then the total is 7 months.



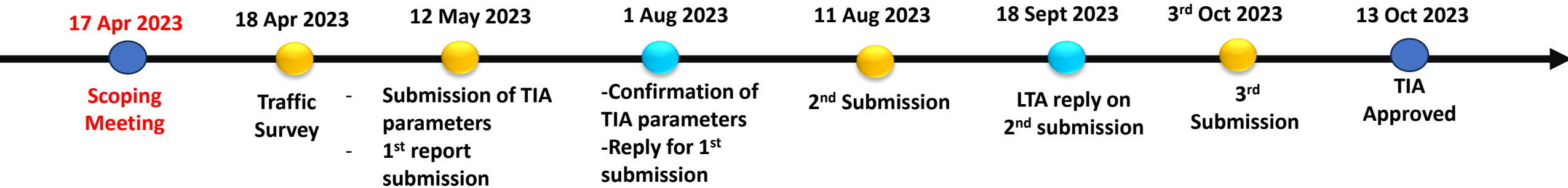
However, there are still gaps on the process and these are areas for further improvement

Since we launched the TIA registration scheme in 2022, of the 28 TIAs (Type 1) that have been conducted, 16 TIAs have been closed. Out of the **16**, 5 took less than 8 months to approve. The remaining 11 took more than 8 months to approve.



What are the key learning points from the TIAs that are closed in *less than 8 months*

Example: Residential development in Toa Payoh

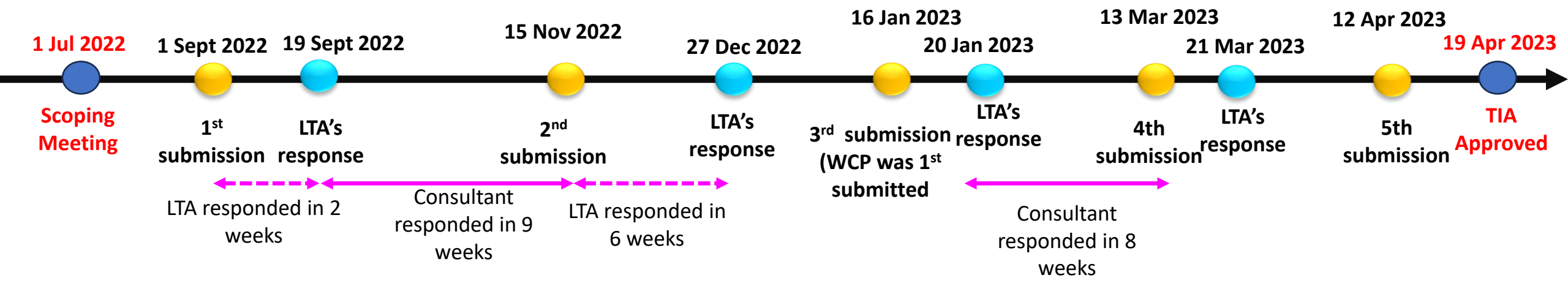


Key observation:

- Clear development parameters and study methodology were provided to carry out the TIA
- LTA and consultant **responded promptly**. The confirmation of TIA parameters, base year model and 1st submission of traffic assessment was done within 3 months due to accurate data computation
- **Developer agreed with the TIA outcome and recommendations for improvements** and this shortened the timeline for subsequent 2nd and 3rd submissions.

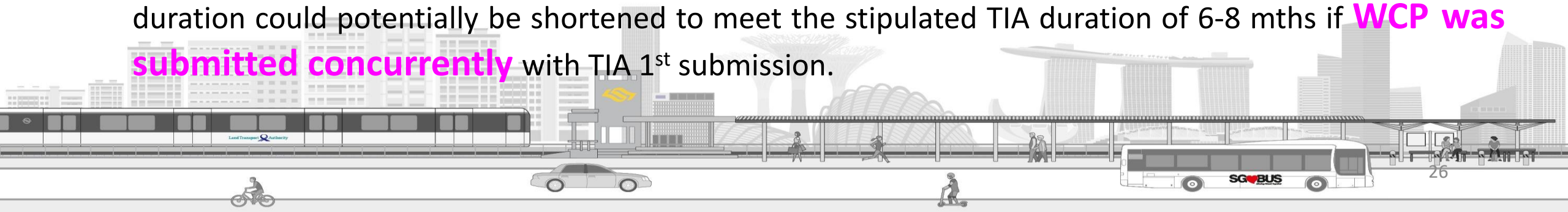


Example: TIA of the proposed residential development at Marine Parade area took *more than 8 months* to be approved

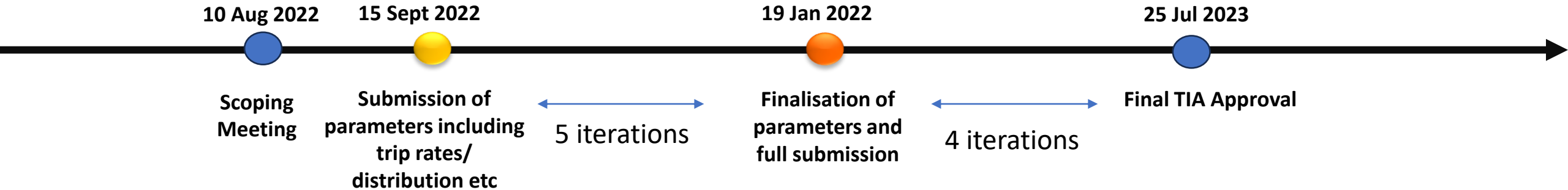


Key observation:

- Both LTA and TIA consultant took extended periods to respond
- WCP was only submitted at the 3rd submission and several iterations required to finalise. The TIA duration could potentially be shortened to meet the stipulated TIA duration of 6-8 mths if **WCP was submitted concurrently** with TIA 1st submission.

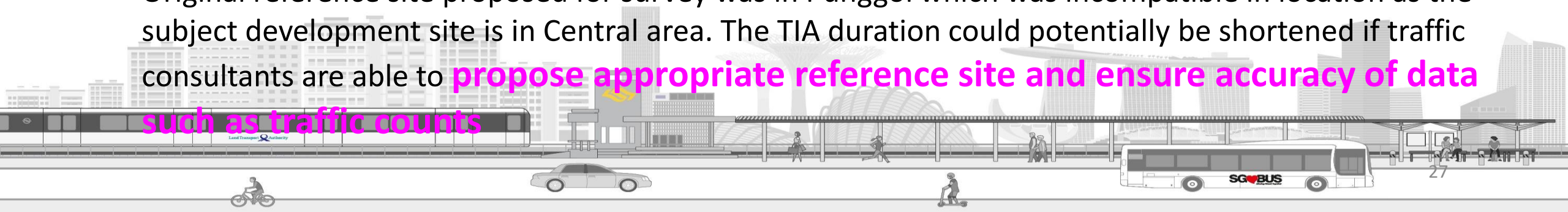


Example: TIA of the proposed commercial and residential development in Rochor took *more than 8 months* to be approved



Key observation:

- Took several iterations and long time to firm up the parameters including the trip rates
- Original reference site proposed for survey was in Punggol which was incompatible in location as the subject development site is in Central area. The TIA duration could potentially be shortened if traffic consultants are able to **propose appropriate reference site and ensure accuracy of data such as traffic counts**



What are the key learning points from these 11 TIAs that led to longer duration to approve/close

(1) Additional time needed to finalise the works recommended in TIA

TIA recommended works to improve internal layout including pick-up/drop-off. However, several discussions among LTA, QP and TC took place to finalise on the works to minimise the impact to the existing development layout.

→ *The TIA duration could potentially be shortened if planned discussions could be more effective by involving the appropriate parties (including developer, QP, architect, TC and relevant LTA SMEs) to resolve and agree on issues/recommendations etc quickly*

(2) Long response time taken by both TIA consultants and LTA

Both LTA and TIA consultant took extended periods to respond which resulted in longer duration to close the TIA. There were also instances where different updated copies of TIA was sent to LTA which led to the need for abortive reviews/comments.

→ *The TIA duration could potentially be shortened if traffic consultants respond promptly and submits only 1 updated copy to LTA. LTA will also internally tighten our internal review process.*

(3) Extended time taken to firm up TIA assumptions and agree on the surveyed parameters

The TIA took several iterations and long time to firm up the parameters including the trip rates.

→ *The TIA duration could potentially be shortened if traffic consultants are able to propose appropriate reference site and ensure accuracy of data such as traffic counts.*

Further Improvements to facilitate submission via CORENETX

A Continue to upskill the industry and internal SMEs

- Continue to conduct relevant courses to ensure Consultants are up to date on LTA's requirements.
- Continue to conduct relevant awareness courses for Developers, Architects, Engineers to understand the need of TIA etc
- Conduct periodic reviews and provide greater clarity on the TIA Requirements and Scope so that it remains transparent

B Streamline process for greater effectiveness

- Tighten the TIA Registration Scheme – LTA will be more stringent in evaluating consultants quality of work
- Continue to conduct regular engagement with the industry

C Leverage on technology to automate & minimize work while increasing efficiency

- Share more info including traffic signal phasing, traffic counts, trip rate data to minimize the need for manual collection
- Develop a common data platform in GIS map base format that consolidates common data required for TIA evaluations
- Streamline Report Submission requirements and management of TIA business process
- Improve quality / speed of TIA evaluations through a common TIA evaluation platform

While LTA will work towards facilitating the approvals for TIA, you play an important role in this

As a Developer

Refer to the **TCOT to see if a TIA** is required / has been imposed on the development. Should a TIA be required, **engage transport consultants early** and engage LTA to start the scoping of the TIA.

Ensure that the engaged **TIA consultant works with the architect early** on to achieve an Optimal Development Design to minimise traffic impact on the overall transport system/network.

As a Traffic Consultant

Apply the technical expertise and professional knowledge of LTA's requirements through the TIA to "inform & guide" the Architect to understand the travel impact of their development; **propose and implement workable solutions** to resolve/minimize its impact to the transport network/system while improving its connectivity and accessibility especially by public transport and active mobility modes.

Respond to LTA's comments in a timely manner.

As an Architect / Engineer

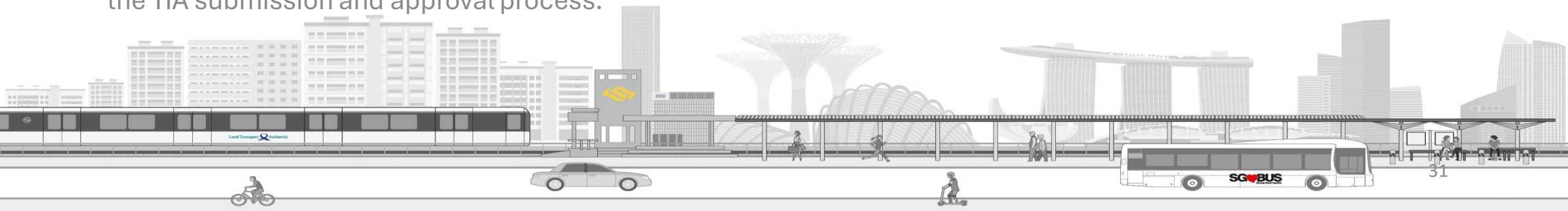
Work with the traffic consultant to design or develop the development, e.g. internal circulation, Pick Up and Drop Off point etc, to ensure that the potential generated traffic does not cause negative externalities to the larger area.

Based on constraints on site, to recommend workable solutions taking into consideration the developer's interest and at the same time the impact on traffic to the larger network/system.

So what's next?

CORENETX is a common digital platform that enables Qualified Persons, Professional Engineers and Architects to submit development-related documents to regulatory agencies. BCA will require all developers to make their submissions, including the TIA, through CORENETX progressively from April 2025.

To facilitate a smooth transition to CORENETX, the Land Transport Authority has proposed enhancements relating to the TIA submission and approval process.



Under the CORENETX platform, a TIA is to be carried out at the Pre-DG stage alongside other agencies requirements prior to DG submission



LTA submission requirement – New Street & Alterations to Existing Street

		Pre-DG Stage (Land Use, TCOT, PAFS, TIA)	Pre Submission Gateway	Design Gateway	Piling Gateway (optional)	Construction Gateway	Independent Submission
1	Objective	To establish RRL and development boundary	To seek clarifications for details to be submitted at DG stage	To establish development platform level and development access that will properly interface with the proposed carriageway	Piling gateway also includes earth retaining structures (slope, retaining wall, CBP etc.) within the road reserve	To finalise all other details necessary for construction of the road and related infrastructure works	To finalise individual agency requirements after construction gateway that do not have any impact on other agencies requirements
2	Road alignment details to be prepared (other details to be prepared and submitted as required)	<ol style="list-style-type: none"> Horizontal alignment Junction layout Commuter facilities Cycling path Road typology Development access RRL / ADR 	As required by Agency / QP to seek clarification from LTA	<ol style="list-style-type: none"> All details as per Land Use Stage Development access levels to tie in to development platform level * Road vertical alignment * (applicable to new streets) Cross-section and details plan Location, extent and layout of retaining wall Location and layout of major structural works that will affect the road vertical and horizontal alignment Layout for Commuter Facilities (e.g. bus stop, covered linkways, POB) * Layout of Active Mobility Infrastructure (i.e. cycling path) Details of street elements (e.g. lamppost, traffic schemes) that needs to be modified. (Applicable for existing streets) 		<ol style="list-style-type: none"> All details as per DG stage Geotechnical details for foundation works, retaining wall, slope etc. Structural details for road structures e.g. POB etc. Engineering details for Commuter Facilities (structural and foundation details) * Road infrastructure / features e.g. drains Details for access points * 	<ol style="list-style-type: none"> Details for street furniture e.g. railings, safety barriers etc. M&E details Signs and pavement markings for roads and cycling paths (traffic plan)
3	Supporting Information required	<ol style="list-style-type: none"> Topo survey Traffic study / TIA 	Traffic study / TIA	<ol style="list-style-type: none"> Topo survey Utilities / services plan 		<ol style="list-style-type: none"> Engineering calculations and PE endorsed reports Utilities services connection plan. 	

* These aspects include (the necessary) interfacing works with the internal layout. Proposed interfacing works should be cleared in tandem with internal layout.

Objective	Pre-DG Stage (Land Use, TCOT, PAFS, TIA)	Pre Submission Consultation	Design Gateway
1 	<ul style="list-style-type: none"> To establish RRL and development boundary 	<ul style="list-style-type: none"> To seek clarifications for details to be submitted at DG stage 	<ul style="list-style-type: none"> To establish the proposed/ existing road profile that will properly interface with the development platform level. To establish the exact locations of development access and road related facilities.
2 	<ul style="list-style-type: none"> To ensure RRL can accommodate standard roadside tables and additional commuter infrastructure To conserve specific roadside trees To ensure existing/proposed park/park connector is safeguarded 	<ul style="list-style-type: none"> To clarify how proposal may affect roadside verges and trees, and/or existing/proposed parks/park connectors. To advise on greenery provisions and tree conservation 	<ul style="list-style-type: none"> To secure greenery provisions and to comment on conservation of trees (may require Certified Arborist report, e.g. recommendations pertaining to works near to, but may not be directly impacting trees) To assess impact to existing, or safeguard provision of new, park/park connector.
3 	<ul style="list-style-type: none"> To establish development boundary, any Drainage Reserve (DR), drain size for affected/proposed public drain and sewer connection, water pipe diversion requirements 	<ul style="list-style-type: none"> To seek clarifications for details to be submitted at DG stage 	<ul style="list-style-type: none"> To assess whether the proposed drainage and sewerage works are in compliance with broad planning parameters (e.g. maximum allowable peak runoff, sewer setback, connection to public sewer etc.).

To prevent abortive work and ensure transport is well taken care of, it is important that the TIA outcomes are completed before DG submission

TIA findings are proposed to mitigate the impact of traffic from the development

Enhancing Public Transport, Pedestrian & Cyclists accessibility

Provide Safe & Efficient Access to Public Transport - Access to nearby bus stops and MRT/LRT stations from development is direct, safe, attractive and convenient

Improve Walking & Cycling within/surrounding the Development - How well-connected are the provision of cycling routes and walking paths from transport nodes to the development

External Physical Improvements – New Roads, Junction enhancements

Assess if traffic performance exceeds TIA thresholds and what further improvements are required, if any

Improving Efficiency within the development

Pick up/Drop Off Provision & Traffic Circulation – evaluate if there is sufficient space catered to different transport modes (depending on type of development) such as taxi, coach, car (including private cars, hired cars such as Grab), motorcycle, goods vehicles, etc

Demand Management & Traffic Ops Plan

Demand Management- How to reduce the traffic generated at Peak Hours and the design considerations to be factored in

Traffic Management Plan – Incorporate operational plans to better cater to anticipated concerns at peak periods within the design of the development



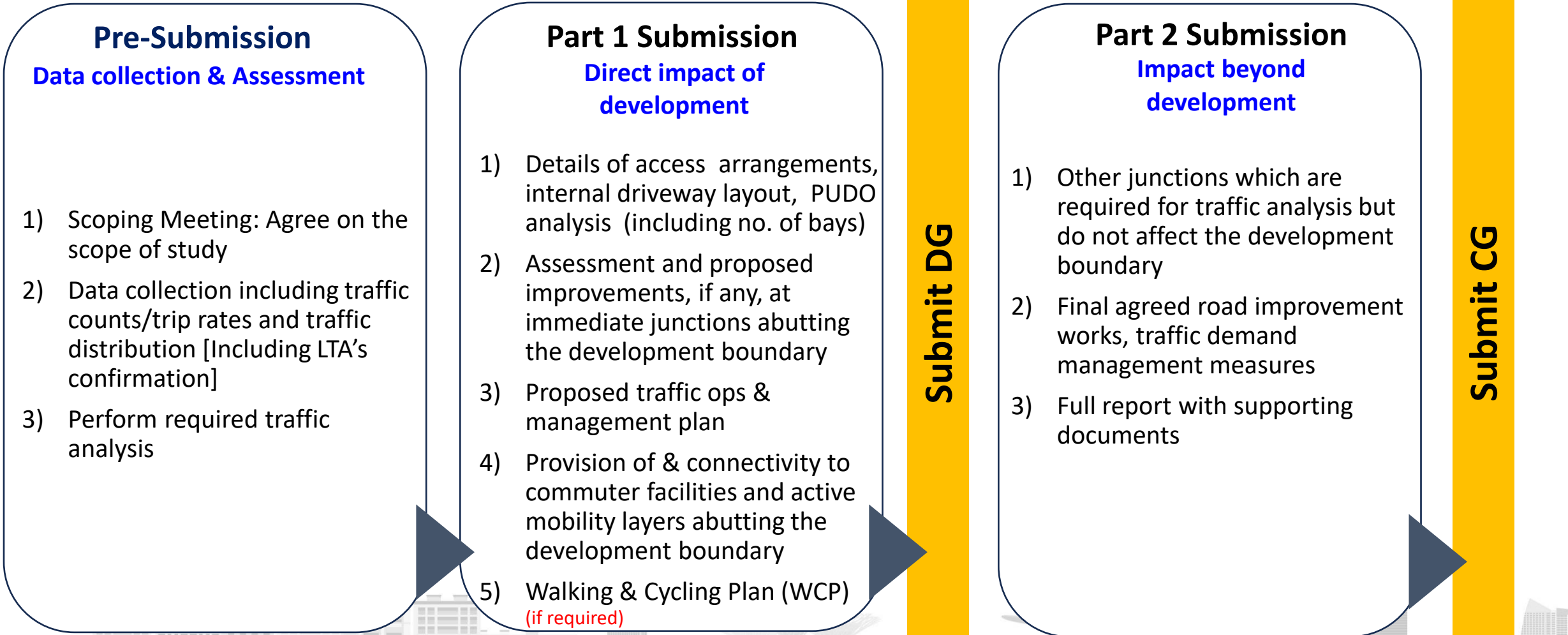
Design Gateway

To establish development platform level and development access that will properly interface with the proposed carriageway

1. All details as per Land Use Stage
2. Development access levels to tie in to development platform level *
3. Road vertical alignment * (applicable to new streets)
4. Cross-section and details plan
5. Location, extent and layout of retaining wall
6. Location and layout of major structural works that will affect the road vertical and horizontal alignment
7. Layout for Commuter Facilities (e.g. bus stop, covered linkways, POB) *
8. Layout of Active Mobility Infrastructure (i.e. cycling path)
9. Details of street elements (e.g. lamppost, traffic schemes) that needs to be modified. (Applicable for existing streets)

1. Topo survey
2. Utilities / services plan

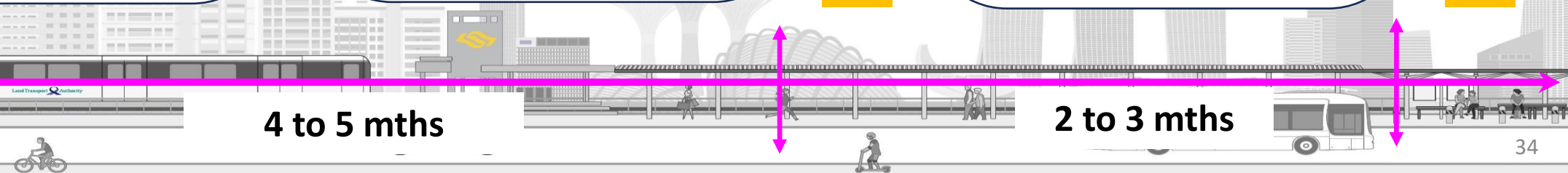
To facilitate submissions via the CORENETX platform, LTA will grant approvals in 2 stages to streamline the TIA process



Timeline

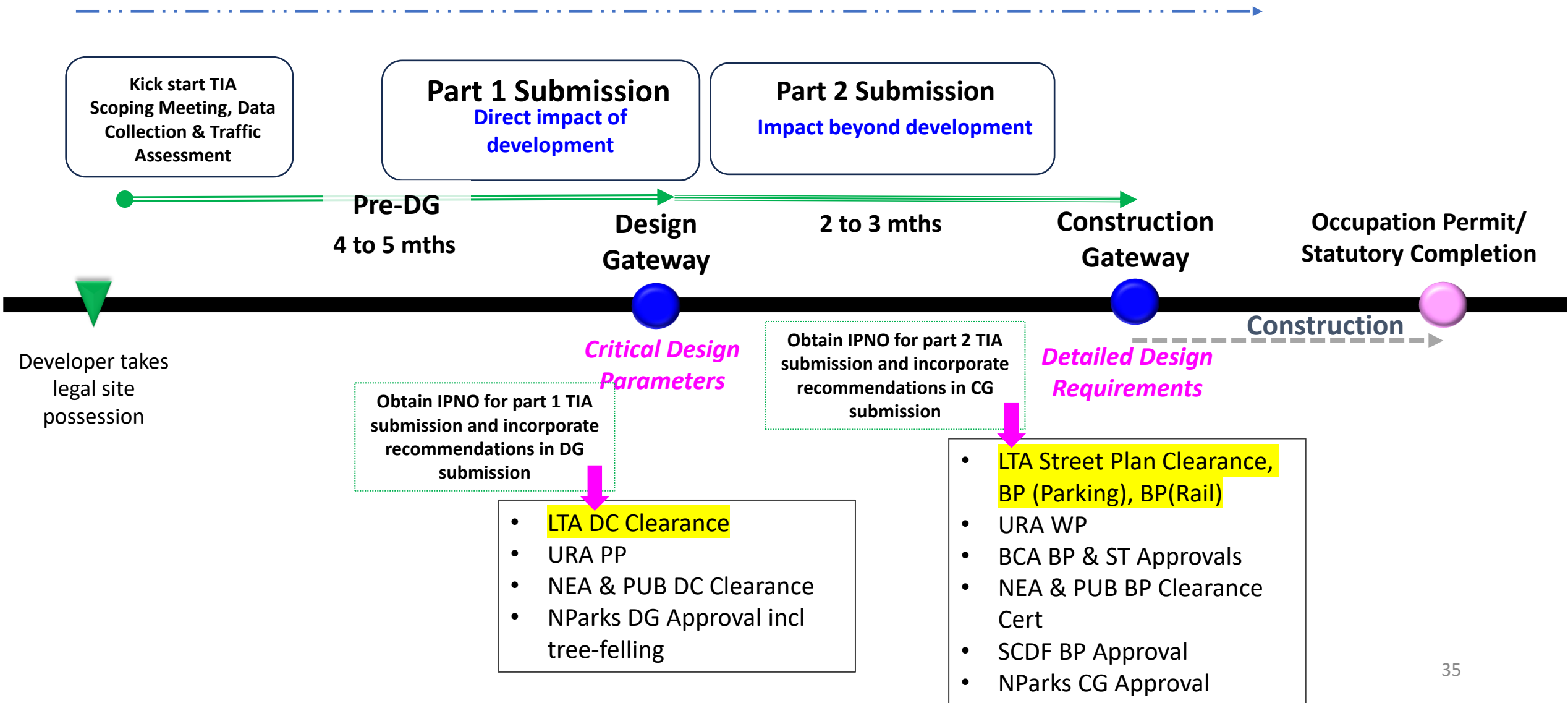
4 to 5 mths

2 to 3 mths



Pre-DG submission of TIA (part) in conjunction with preparation of other clearances after developer takes legal site possession

Achieve sales launch within 12-15 mths



Questions & Answers

Thank you

