

Guide to Traffic Impact Assessment Case Studies

Please note these case studies are for illustrative purposes only, they are not actual proposals

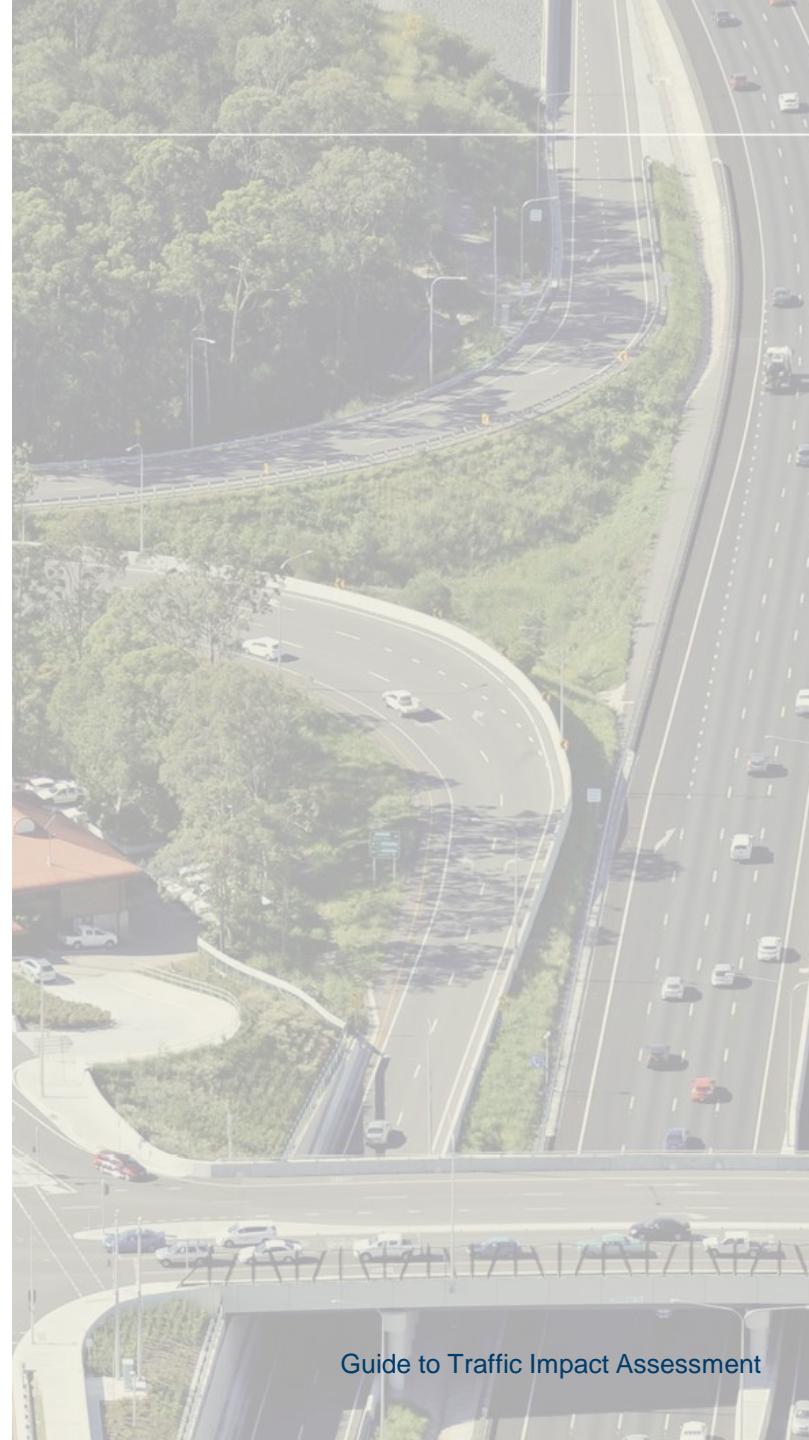
August 2017

Prepared by

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Case Studies

1. Case study 1: Urban context – impacts on over capacity base network
2. Case study 2: Large hardware retailer in under capacity road network
3. Case study 3: Large quarry in rural area
4. Case study 4: Small residential development in under capacity road network



Guide to Traffic Impact Assessment

Replaces the *Guidelines for Assessment of Road Impacts of Development (GARID)*

Guide to Traffic Impact Assessment 2017

This document will support planning and development decisions under the *Planning Act 2016* (and superseded planning legislation such as the *Sustainable Planning Act 2009*), the *State Development and Public Works Organisation Act 1971*, the *Environmental Protection Act 1994* and the *Economic Development Act 2012*.

This document will also support notifiable road use decisions under the *Mineral and Energy Resources (Common Provisions) Act 2014*, *Greenhouse Gas Storage Act 2009* and the *Petroleum Act 1923*.

Please note reference to legislation and supporting planning instruments such as the *State Development Assessment Provisions* may change.

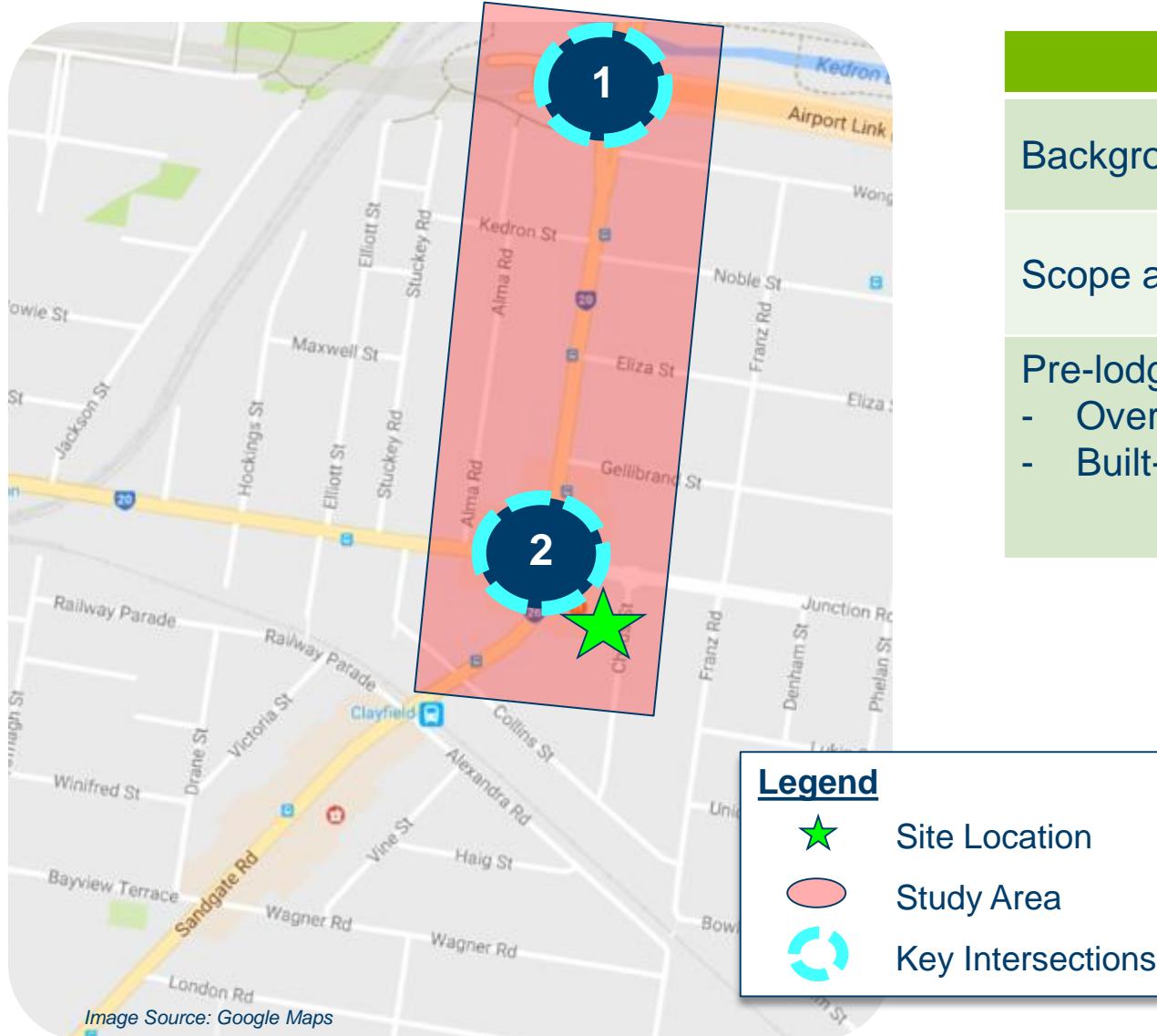
Comments, suggestions for changes, further inclusions or errors can be submitted to planningpolicy@tmr.qld.gov.au.



WORKED CASE STUDY

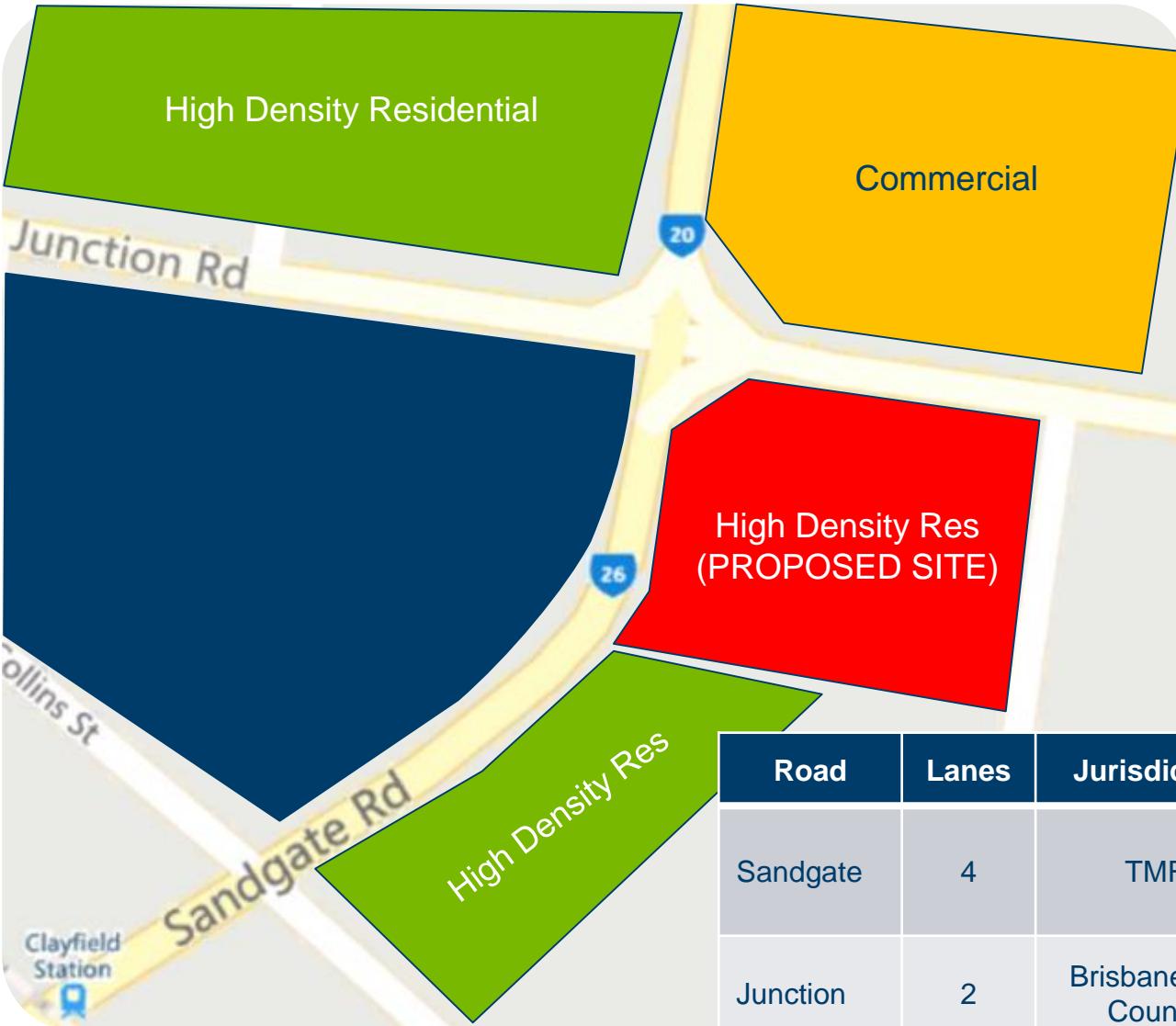
Case Study 1: Urban context – impacts on over capacity base network

Step 1: Introduction



| TIA Item | Assessment |
|---|------------|
| Background Info | ✓ |
| Scope and Study Area | ✓ |
| Pre-lodgement Meeting Notes: - Over capacity road network - Built-up, dense environment | |

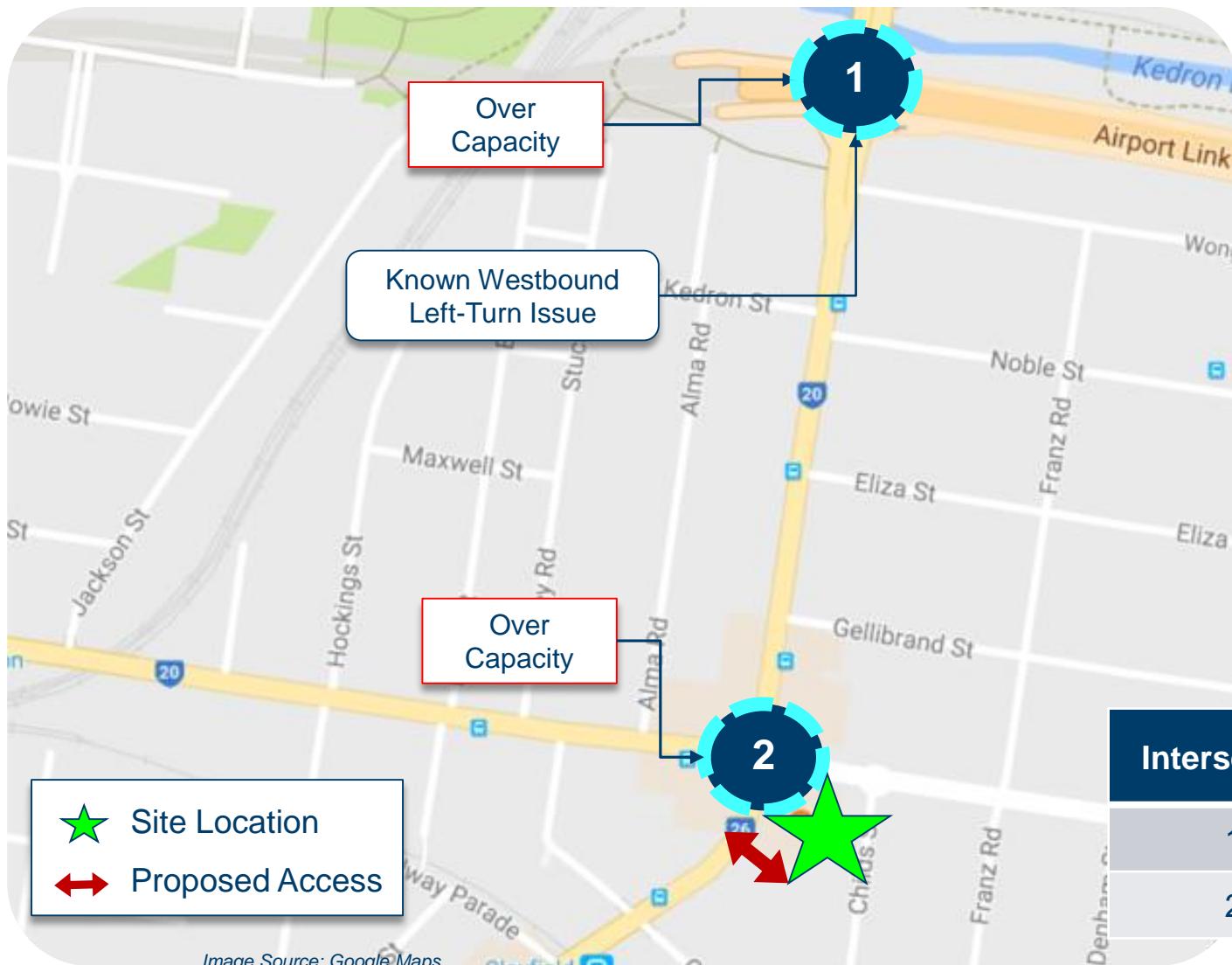
Step 2: Existing conditions



| TIA Item | Assessment |
|------------------------------|------------|
| Land use and Zoning | ✓ |
| Adjacent Land Uses/Approvals | ✓ |
| Surrounding Road Details | ✓ |

| Road | Lanes | Jurisdiction | Divided | Speed | Comment |
|----------|-------|-----------------------|---------|-------|----------------|
| Sandgate | 4 | TMR | Yes | 70kph | Major Arterial |
| Junction | 2 | Brisbane City Council | Yes | 60kph | Sub Arterial |

Step 2: Existing conditions



| TIA Item | Assessment |
|--------------------------------------|------------|
| Traffic Volumes | ✓ |
| Intersection and Network Performance | ✓ |
| Road Safety Issues | ✓ |
| Site Access | ✓ |

| Intersection | Recent Data Available? |
|--------------|------------------------|
| 1 | Yes (2015 Data) |
| 2 | Yes (2015 Data) |

Step 2: Existing conditions



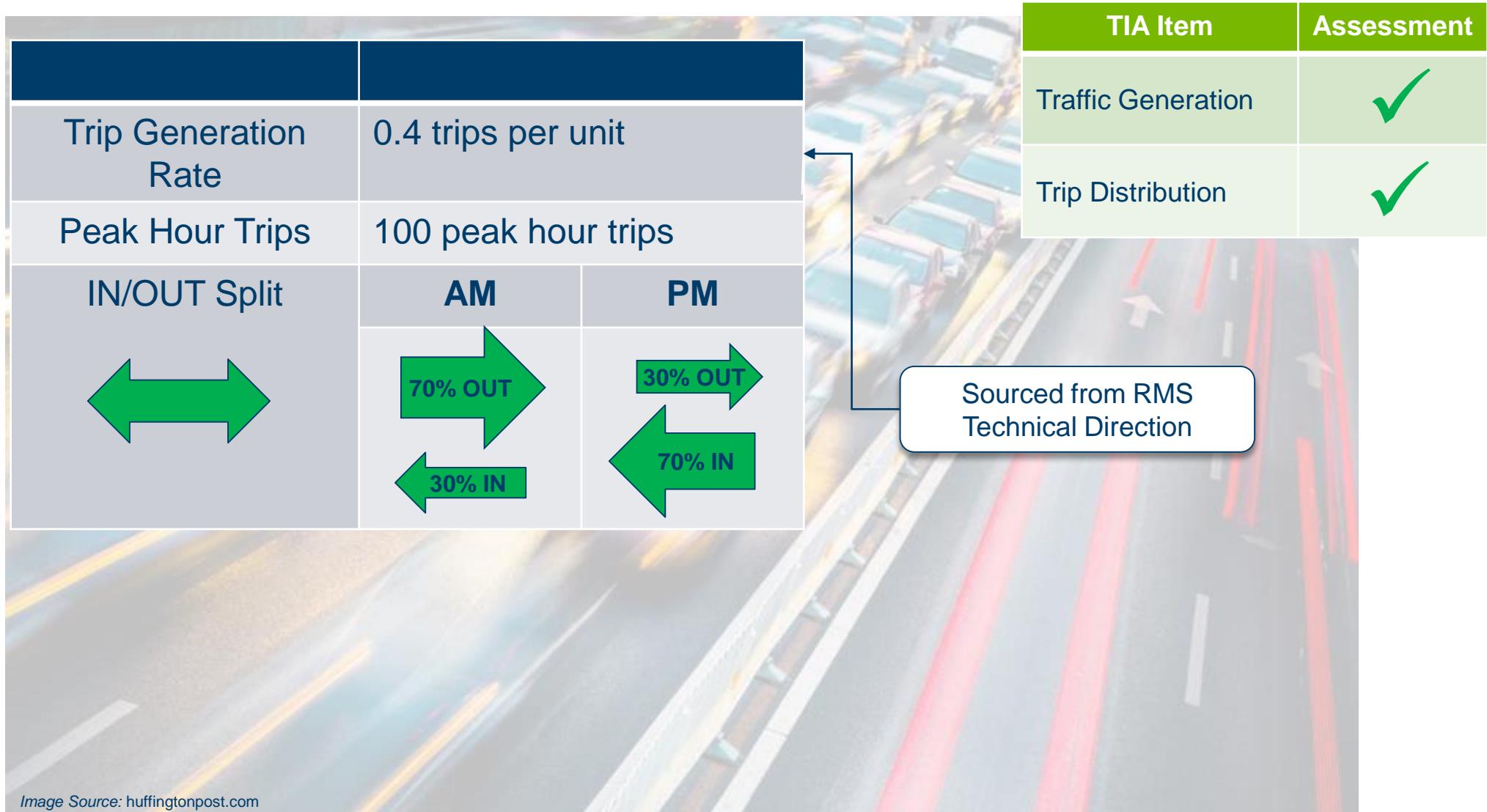
| TIA Item | Assessment |
|--------------------------|------------|
| Public Transport | ✓ |
| Active Transport | ✓ |
| Parking | NA |
| Pavement | NA |
| Transport Infrastructure | NA |

Step 3: Proposed development details



| TIA Item | Assessment |
|-----------------------------|------------|
| Development Site Plan | ✓ |
| Operational Details | ✓ |
| Proposed Access and Parking | ✓ |

Step 4: Development traffic



Step 4: Development traffic



| TIA Item | Assessment |
|---|------------|
| Development Traffic Volumes on Network | ✓ |
| Notes: Distribution is based on: ❖ <i>Traffic Survey Data</i> | |

Step 5: Impact assessment and mitigation



The development traffic versus 2018 background traffic represents **> 5% increase on a number of movements** at Intersection 1 and Intersection 2

| TIA Item | Assessment |
|--------------------------------------|-------------|
| With and Without Development Traffic | ✓ |
| TIA Aspect | Assessable? |
| Construction Impact | NO |
| Road Safety Impact | YES |
| Access and Frontage Impact | YES |
| Intersection Delay Impact | YES |
| Road Link Capacity | NO |
| Pavement Impact | NO |
| Transport Infrastructure Impact | NO |

Image Source: Google Maps

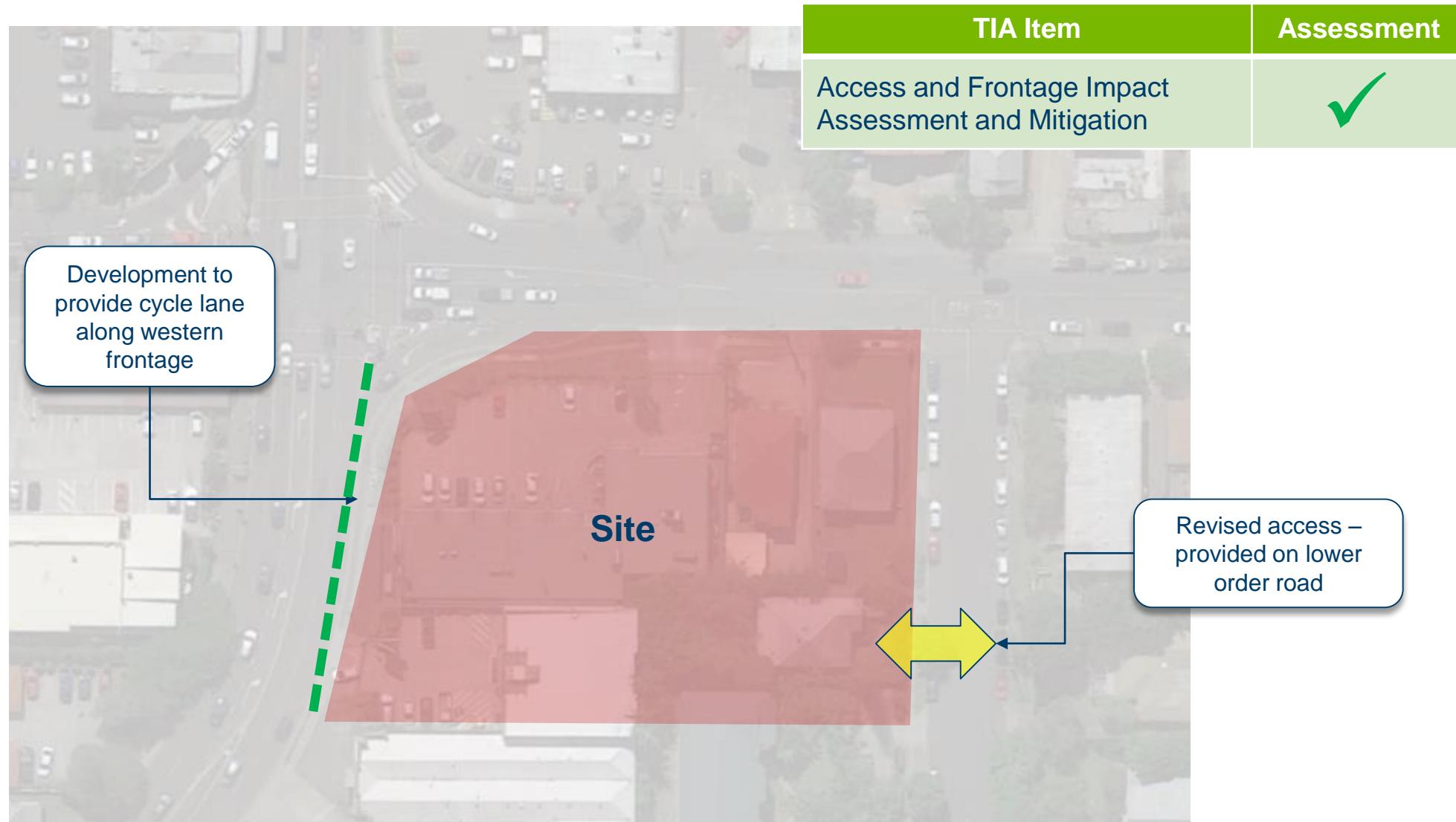
Step 5: Impact assessment and mitigation

| Risk Item | Without development | | | With Development | | |
|--|---------------------|-------------|--------|------------------|-------------|--------|
| | Likelihood | Consequence | Result | Likelihood | Consequence | Result |
| Westbound left-turn at Intersection 1 queues into adjacent through lane during PM peak | 5 | 2 | M | 5 | 2 | M |
| Proposed site access directly from SCR – no ability to signalise access due to proximity to adjacent signalised intersection | 1 | 1 | L | 4 | 2 | M |

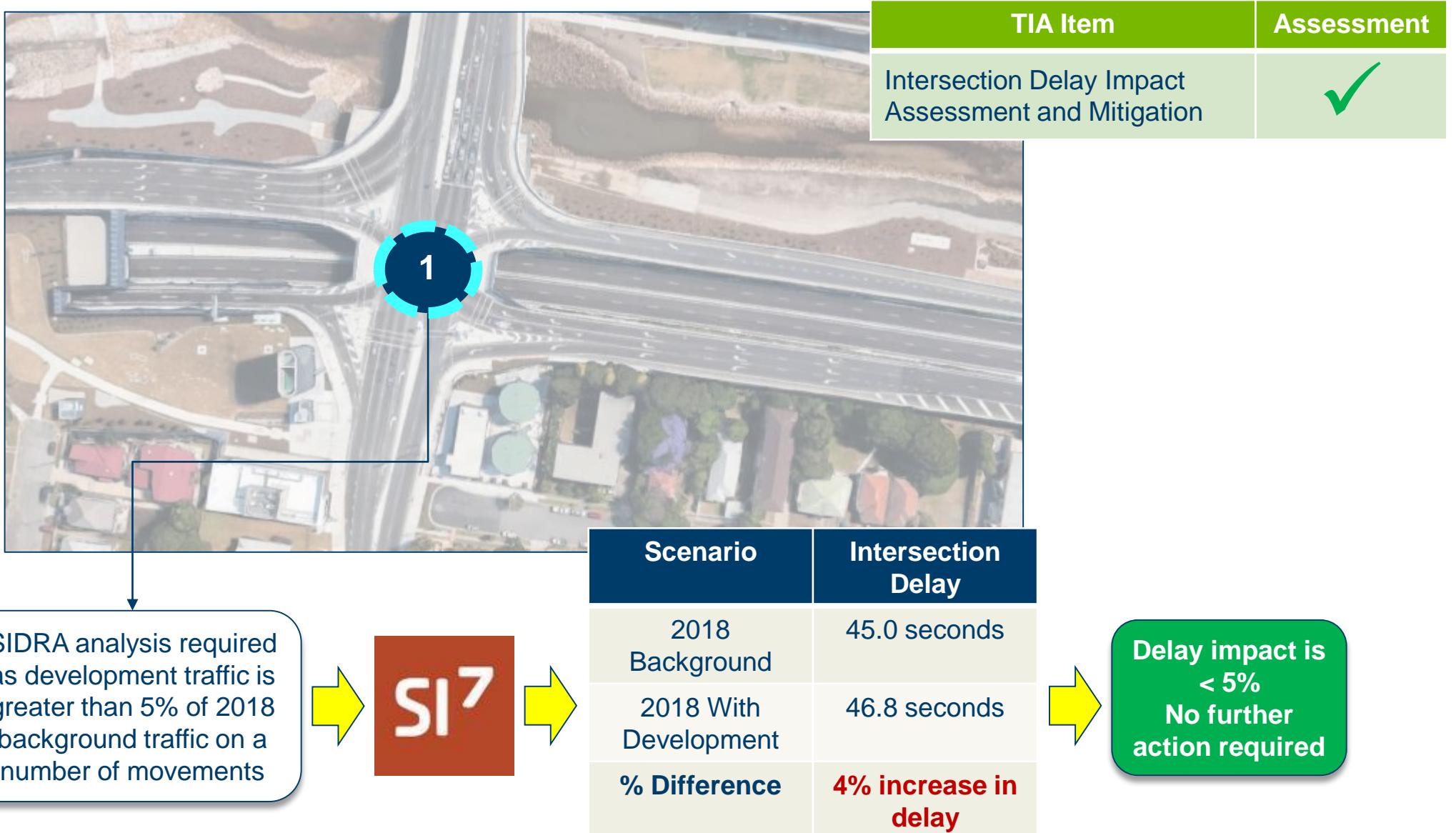
| Risk Item | Mitigation | With Development + Mitigation | | |
|--|--|-------------------------------|-------------|--------|
| | | Likelihood | Consequence | Result |
| Westbound left-turn at Intersection 1 queues into adjacent through lane during PM peak | No Action | - | - | - |
| Proposed site access directly from SCR – no ability to signalise access due to proximity to adjacent signalised intersection | “Avoid” – Access to be taken from lower order road | 1 | 1 | L |

| TIA Item | Assessment |
|--|------------|
| Road Safety Impact Assessment and Mitigation | ✓ |

Step 5: Impact assessment and mitigation



Step 5: Impact assessment and mitigation



Step 5: Impact assessment and mitigation



SIDRA analysis required as development traffic is greater than 5% of 2018 background traffic on a number of movements

SI7

| Scenario | Intersection Delay |
|-----------------------|------------------------------|
| 2018 Background | 45.0 seconds |
| 2018 With Development | 54.0 seconds |
| % Difference | 20% increase in delay |

| TIA Item | Assessment |
|---|------------|
| Intersection Delay Impact Assessment and Mitigation | ✓ |

Delay impact is > 5% Investigate “Avoid, Manage or Mitigate” options

Step 5: Impact assessment and mitigation



Proposed “Manage” option to include a reduction in on-site car parking as a Travel Demand Measure (TDM) – **reduces development trip generation by 15%**

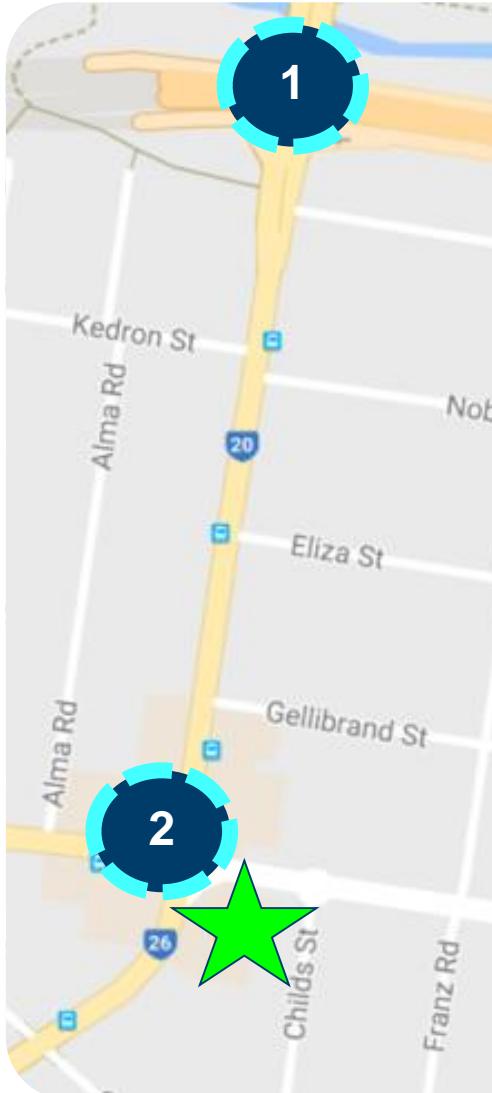
SI7

| Scenario | Intersection Delay |
|-----------------------------|-----------------------------|
| 2018 Background | 45.0 seconds |
| 2018 With Development + TDM | 50.0 seconds |
| % Difference | 9% increase in delay |

| TIA Item | Assessment |
|---|------------|
| Intersection Delay Impact Assessment and Mitigation | ✓ |

Delay impact remains > 5% Investigate further options to reduce delay impact

Step 5: Impact assessment and mitigation



No ability to provide mitigation works at **Intersection 2** due to built-up surrounding development

However, there is an ability to **upgrade Intersection 1** and potentially achieve “no net worsening”

Analyse upgrade mitigation works at **Intersection 1** using SIDRA

SI⁷

| TIA Item | Assessment |
|---|------------|
| Intersection Delay Impact Assessment and Mitigation | ✓ |

15% delay reduction at Intersection 1 plus 9% delay increase at Intersection 2 = **6% network delay improvement**

“No Net Worsening” Achieved

| Scenario | Intersection Delay |
|---|-------------------------------|
| 2018 Background | 35.0 seconds |
| 2018 With Development + Mitigation at Intersection 1 | 30.0 seconds |
| % Difference | 15% reduction in delay |

Step 5: Impact assessment and mitigation

Assess the need for a road safety assessment or audit for the proposed upgrade works at Intersection 1

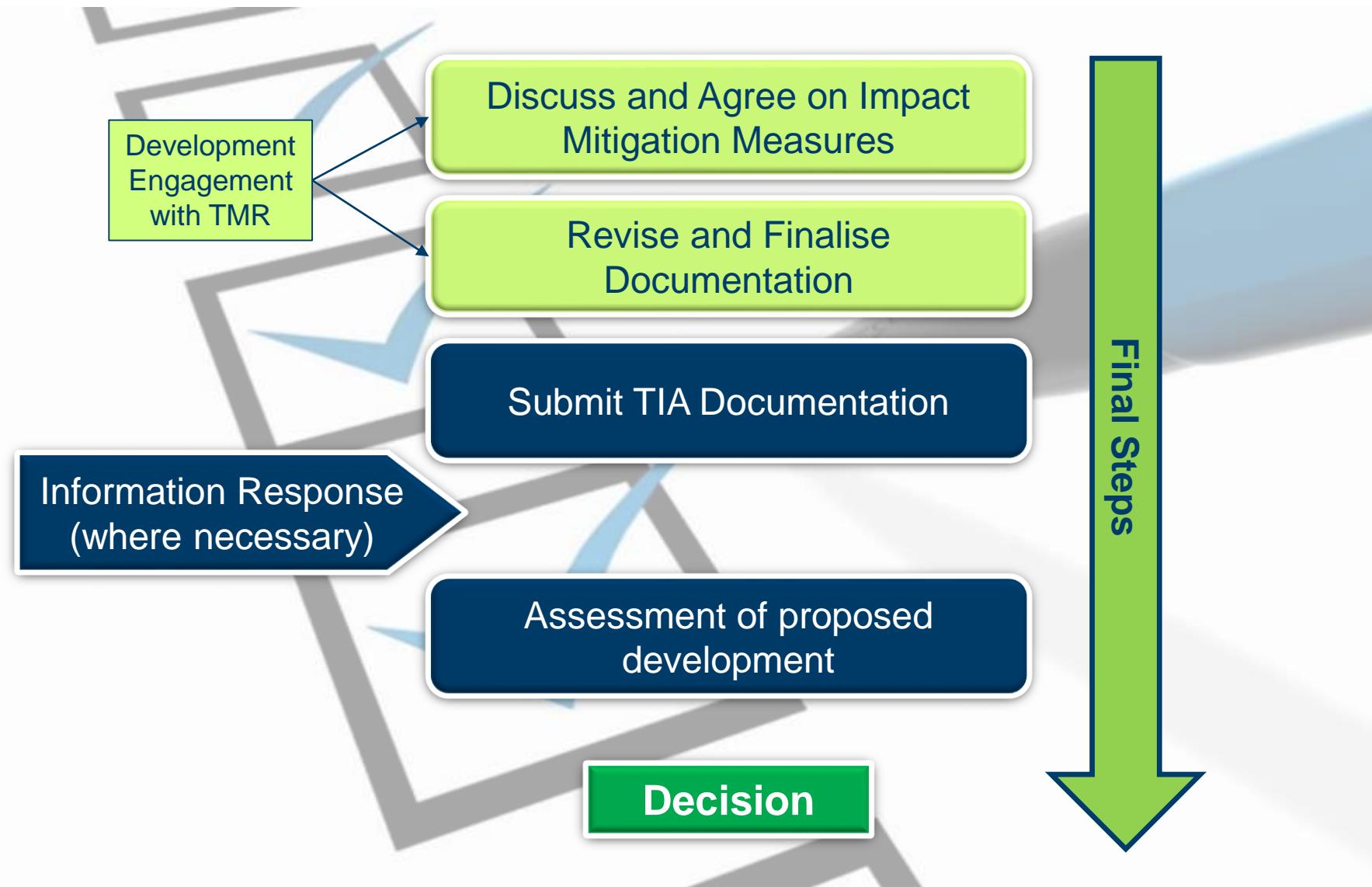
| Traffic Volume (AADT) | Speed (kph) | | |
|--------------------------|-------------|----------------|---------|
| | Up to 50kph | 60kph to 70kph | 80kph + |
| ≤ 8000 | Low | Medium | Medium |
| ≥ 8000 | Medium | Medium | High |

| Development Type | Road Environment Safety Rating | | |
|-----------------------------|--------------------------------|---------------------------|----------------------|
| | Low | Medium | High |
| Major Development | Road Safety Assessment | Road Safety Audit | Road Safety Audit |
| Planning Act Development | Road Safety Assessment | Road Safety Assessment | Road Safety Audit |

A Road Safety Assessment is required to be undertaken for the proposed upgrade works at Intersection 1

| TIA Item | Assessment |
|--|------------|
| Road Safety Impact Assessment and Mitigation | ✓ |

Impact mitigation measures, finalisation and submission



WORKED CASE STUDY

Case Study 2: Large hardware retailer in under capacity road network

Step 1: Introduction

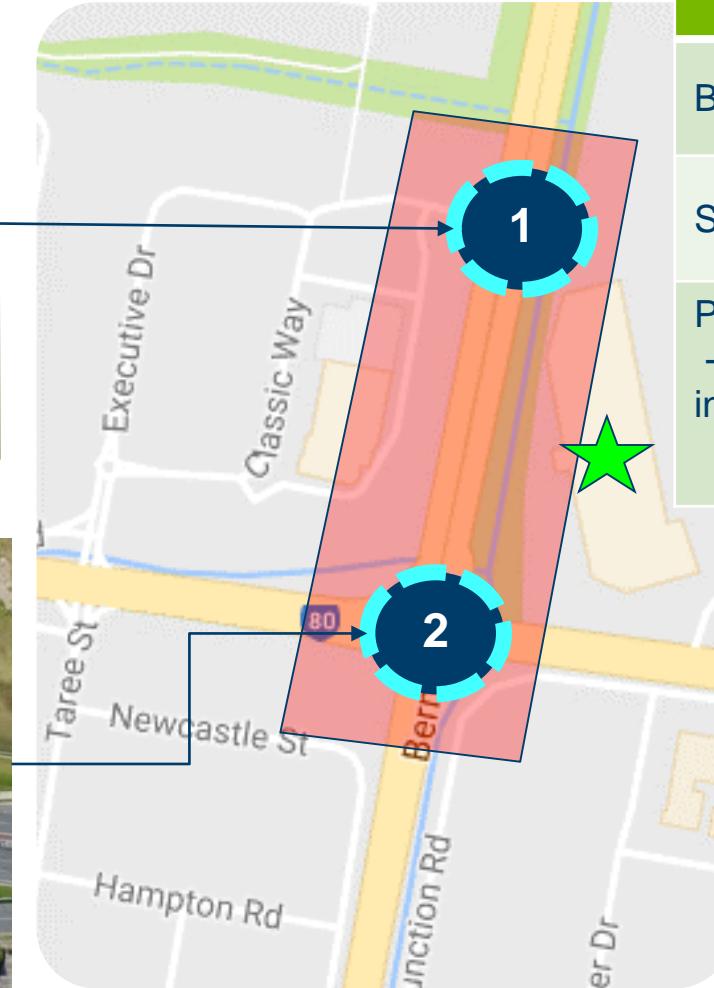


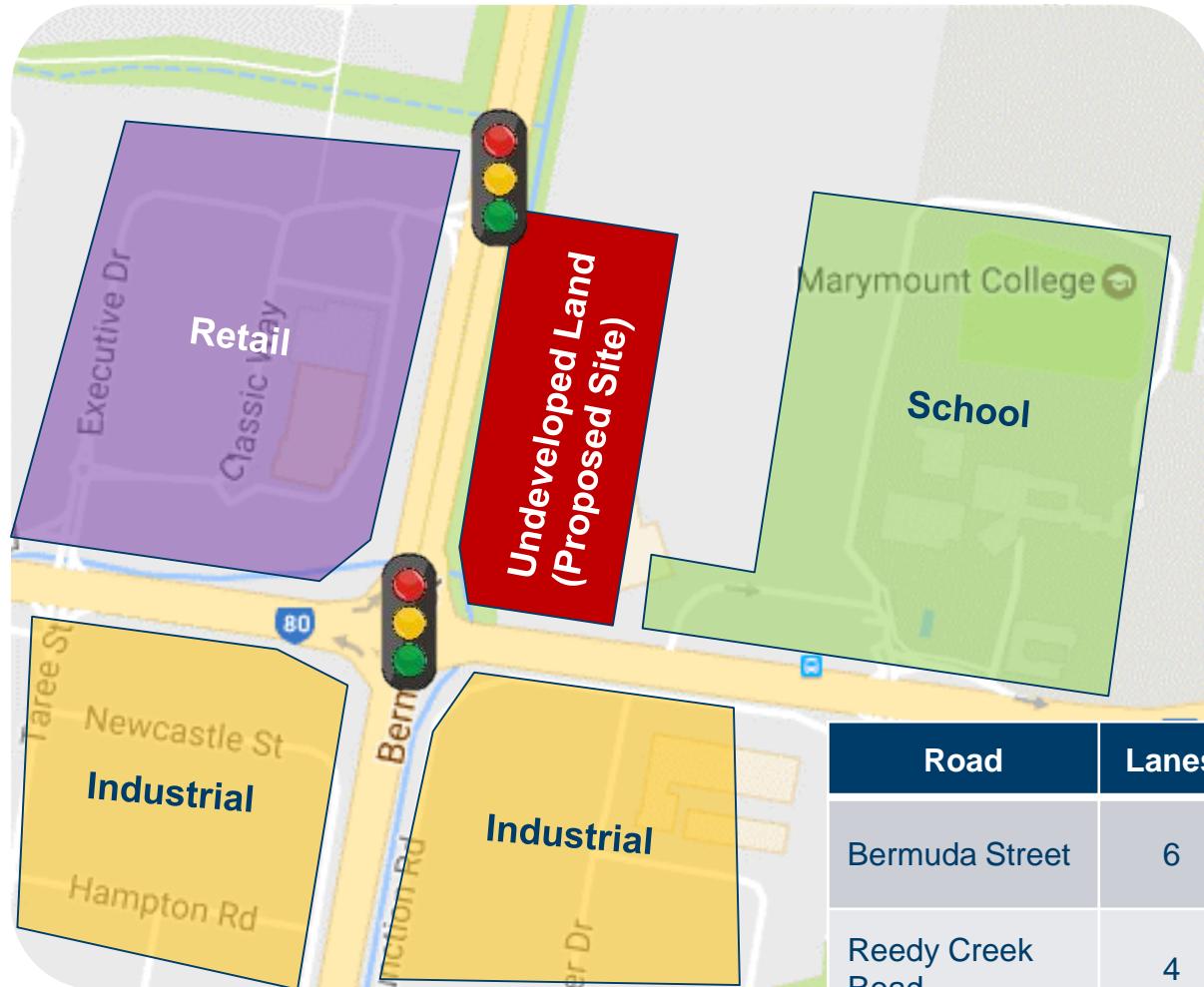
Image Source: Google Maps

| TIA Item | Assessment |
|--|------------|
| Background Info | ✓ |
| Scope and Study Area | ✓ |
| Pre-lodgement Meeting Notes: - analysis required for the signalised intersections of Intersection 1 and Intersection 2 | |

Legend

- ★ Site Location
- Study Area
- Key Intersections

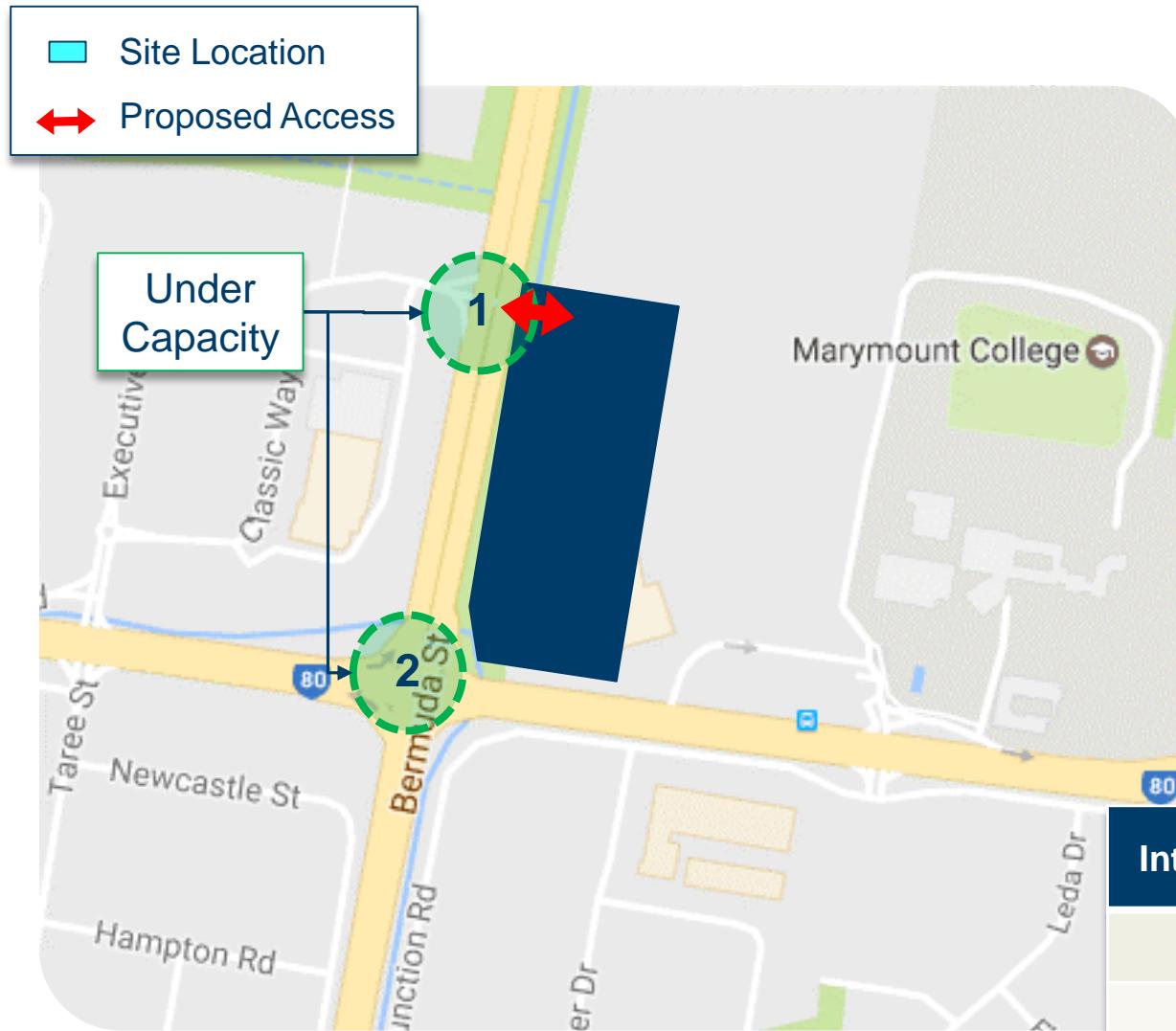
Step 2: Existing conditions



| TIA Item | Assessment |
|------------------------------|------------|
| Land use and Zoning | ✓ |
| Adjacent Land Uses/Approvals | ✓ |
| Surrounding Road Details | ✓ |

| Road | Lanes | Jurisdiction | Divided | Speed | Comment |
|------------------|-------|--------------|---------|-------|----------------|
| Bermuda Street | 6 | TMR | Yes | 70kph | Major Arterial |
| Reedy Creek Road | 4 | TMR | Yes | 80kph | Major Arterial |

Step 2: Existing conditions



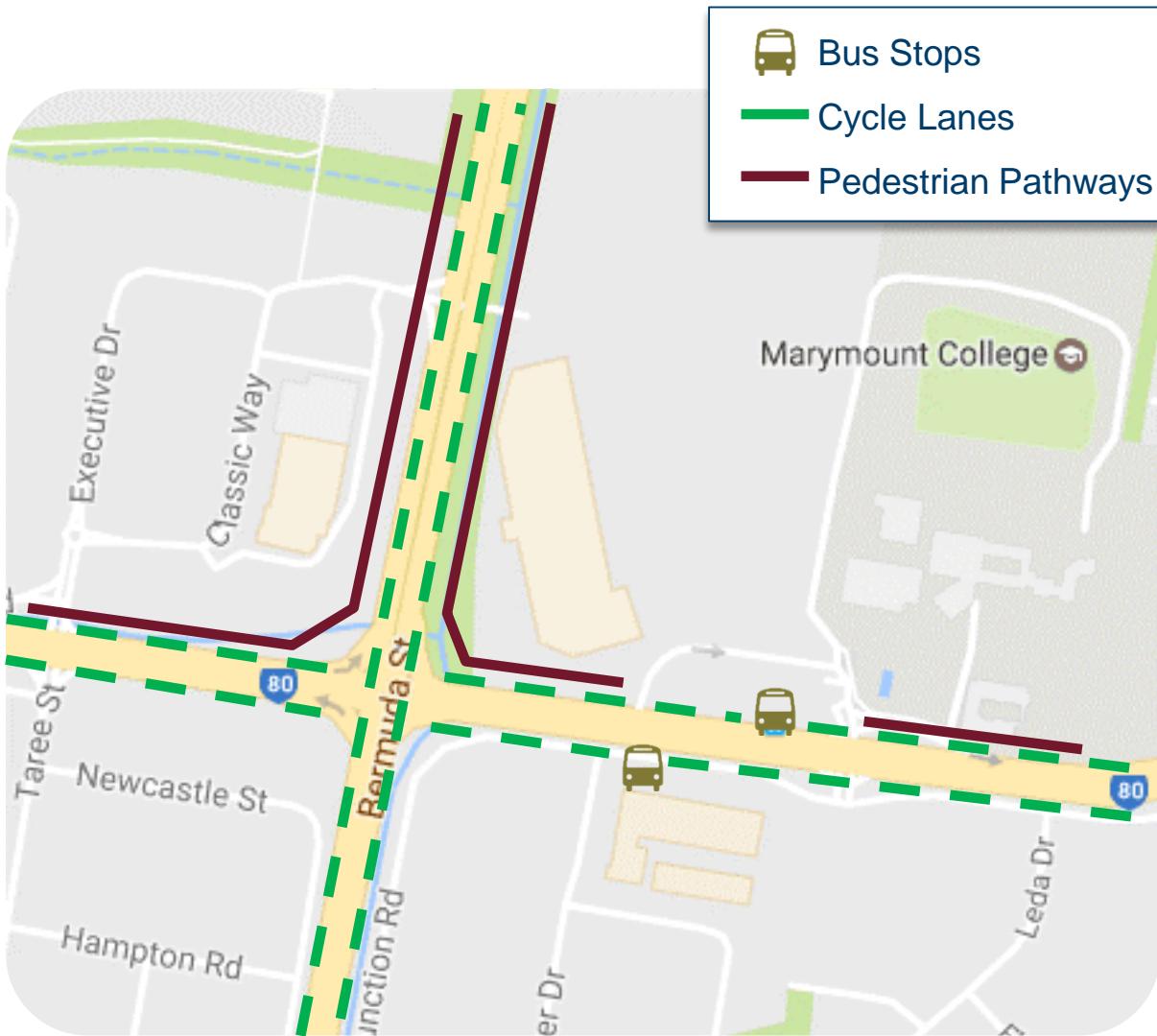
| TIA Item | Assessment |
|--------------------------------------|------------|
| Traffic Volumes | ✓ |
| Intersection and Network Performance | ✓ |
| Road Safety Issues | ✓ |
| Site Access | ✓ |

Notes:

- No current road safety issues;
- Recent traffic survey data used.

| Intersection | Recent Data Available? |
|--------------|------------------------|
| 1 | Yes (2015 Data) |
| 2 | Yes (2015 Data) |

Step 2: Existing conditions



| TIA Item | Assessment |
|--------------------------|------------|
| Public Transport | ✓ |
| Active Transport | ✓ |
| Parking | NA |
| Pavement | NA |
| Transport Infrastructure | NA |

Step 3: Proposed development details



- ❖ **2018 Year of Opening**
- ❖ **12,600m² GFA Bulky Goods Retailer**
- ❖ **340 Peak Vehicle Trips**
- ❖ **350 Parking Spaces**
- ❖ **Access on major road**

| TIA Item | Assessment |
|--|------------|
| Development Site Plan | ✓ |
| Operational Details | ✓ |
| Proposed Access and Parking | ✓ |
| Notes: the morning site peak hour during weekdays does not generally coincide with the network peak hour | |

Step 4: Development traffic

| Item | Result | | | | | | | | | |
|----------------------|---|----|----|----|---------|--|--|--------|--|--|
| Trip Generation Rate | 2.7 trips per 100m ² | | | | | | | | | |
| Peak Hour Trips | $2.7 \times 12,600\text{m}^2 \text{ GFA}$ = 340 peak hour trips | | | | | | | | | |
| IN/OUT Split | <table border="1"><thead><tr><th></th><th>AM</th><th>PM</th></tr></thead><tbody><tr><td>50% OUT</td><td></td><td></td></tr><tr><td>50% IN</td><td></td><td></td></tr></tbody></table> | | AM | PM | 50% OUT | | | 50% IN | | |
| | AM | PM | | | | | | | | |
| 50% OUT | | | | | | | | | | |
| 50% IN | | | | | | | | | | |

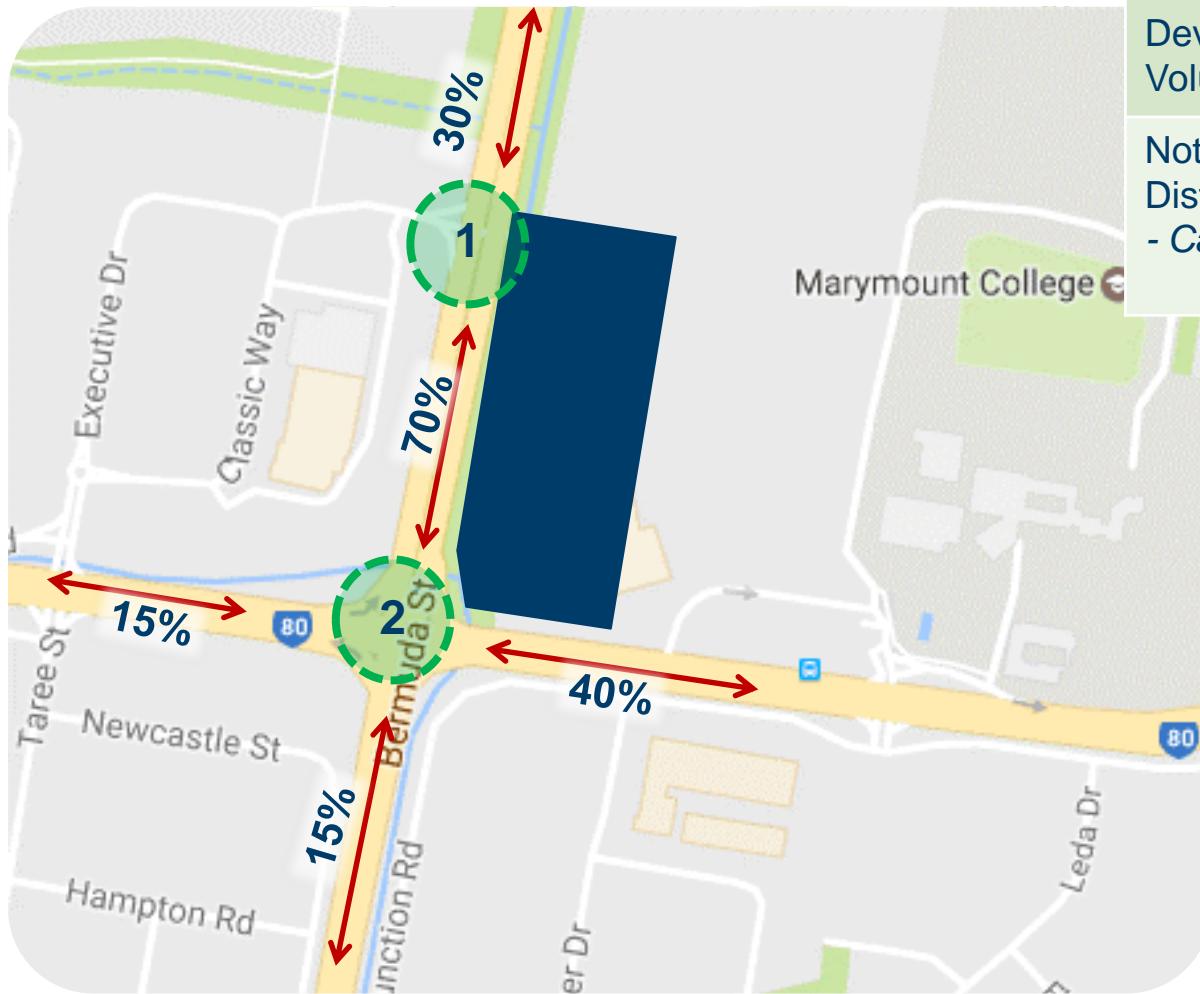
TIA Item | **Assessment**

| | |
|--------------------|---|
| Traffic Generation | ✓ |
| Trip Distribution | ✓ |

Sourced from RMS Technical Note

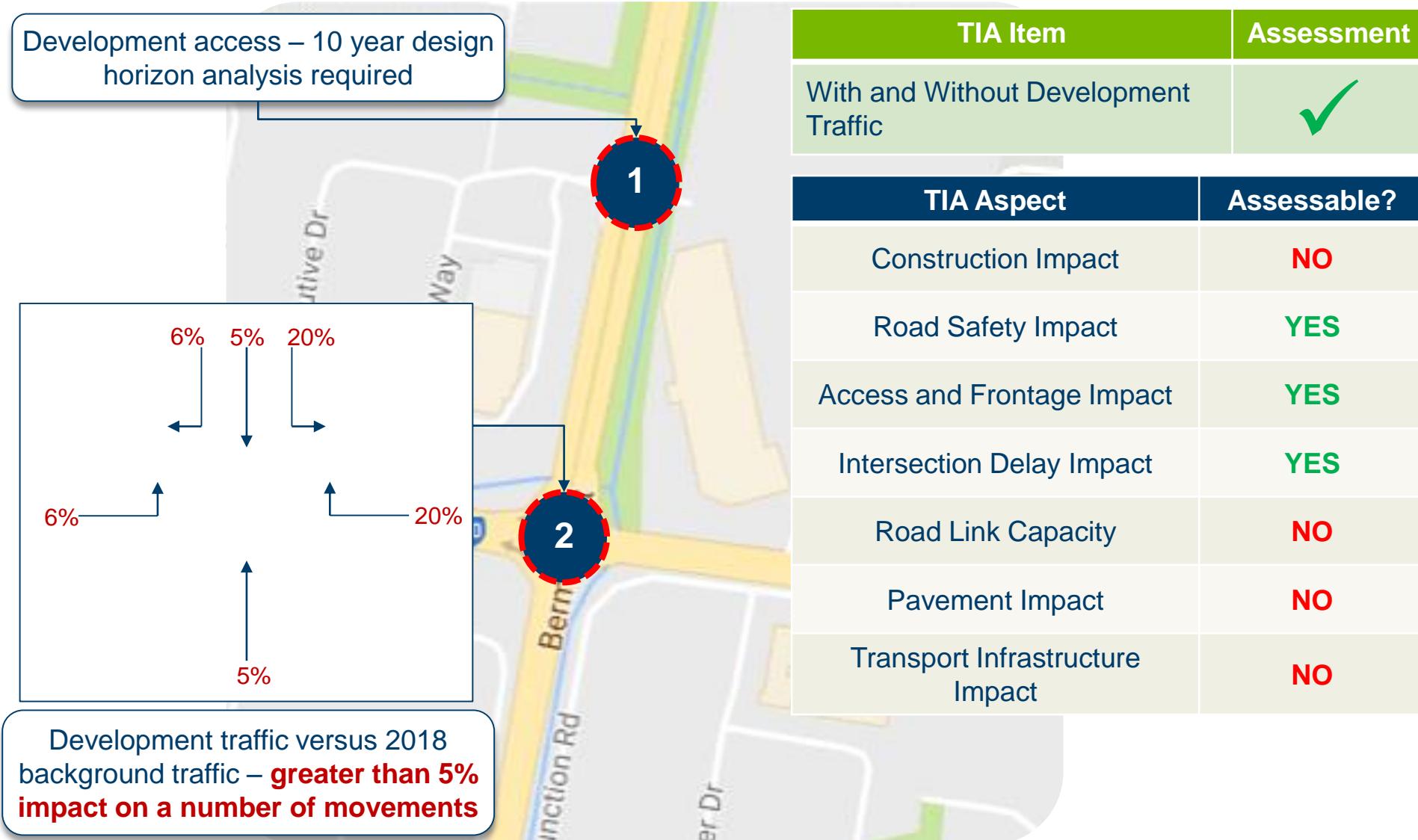
Image Source: huffingtonpost.com

Step 4: Development traffic



| TIA Item | Assessment |
|---|------------|
| Development Traffic Volumes on Network | ✓ |
| Notes: Distribution is based on: - Catchment Analysis | |

Step 5: Impact assessment and mitigation



Step 5: Impact assessment and mitigation

| Risk Item | Without Development | | | With Development | | |
|---|---------------------|-------------|--------|------------------|-------------|--------|
| | Likelihood | Consequence | Result | Likelihood | Consequence | Result |
| Westbound right-turn at Intersection 2 queuing into adjacent through lane | 1 | 2 | L | 5 | 2 | M |

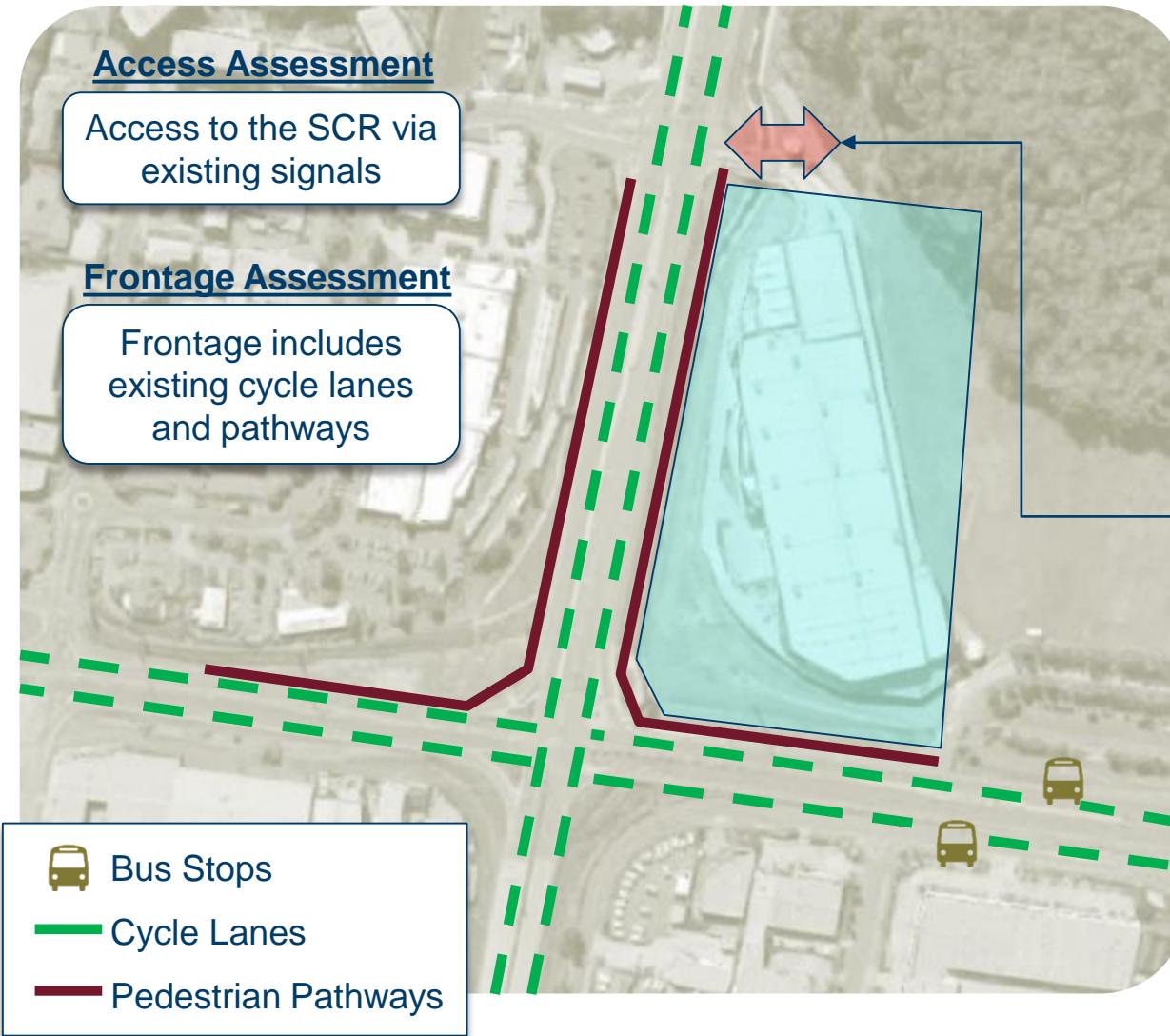
| Risk Item | Mitigation | With Development + Mitigation | | |
|---|--|-------------------------------|-------------|--------|
| | | Likelihood | Consequence | Result |
| Westbound right-turn at Intersection 2 queuing into adjacent through lane | Extend or duplicate the right-turn lane to cater for the increased right-turn demand | 1 | 2 | L |

| TIA Item | Assessment |
|--|------------|
| Road Safety Impact Assessment and Mitigation | ✓ |

Step 5: Impact assessment and mitigation

| Traffic Volume (AADT) | Speed (kph) | | | | TIA Item | Assessment |
|--|--------------------------------|------------------------|------------------------------------|--|--|------------|
| | Up to 50kph | 60kph to 70kph | 80kph + | | Road Safety Impact Assessment and Mitigation | ✓ |
| ≤ 8000 | Low | Medium | Medium | | | |
| ≥ 8000 | Medium | Medium | High | | | |
| | | | | | | |
| Reedy Creek Road Traffic Volumes ≥ 8000 | | | Reedy Creek Road Speed Limit 80kph | | | |
| Development Type | Road Environment Safety Rating | | | | | |
| | Low | Medium | High | | | |
| Major Development | Road Safety Assessment | Road Safety Audit | Road Safety Audit | | | |
| Planning Act Development | Road Safety Assessment | Road Safety Assessment | Road Safety Audit | | | |
| A Road Safety Audit is required to be undertaken for the extension/ duplication of right-turn lane | | | | | | |

Step 5: Impact assessment and mitigation

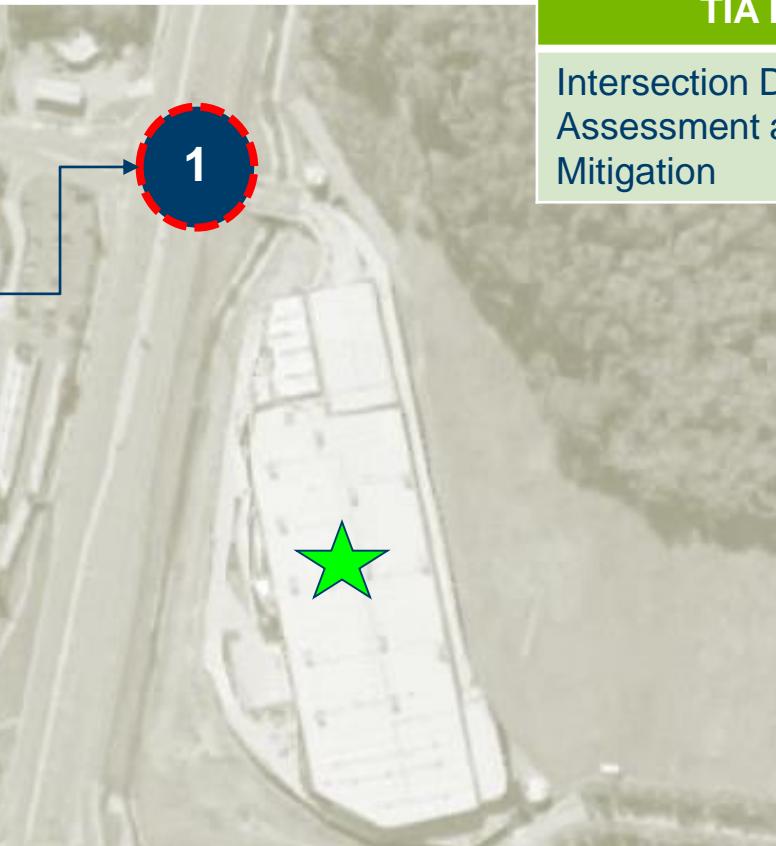
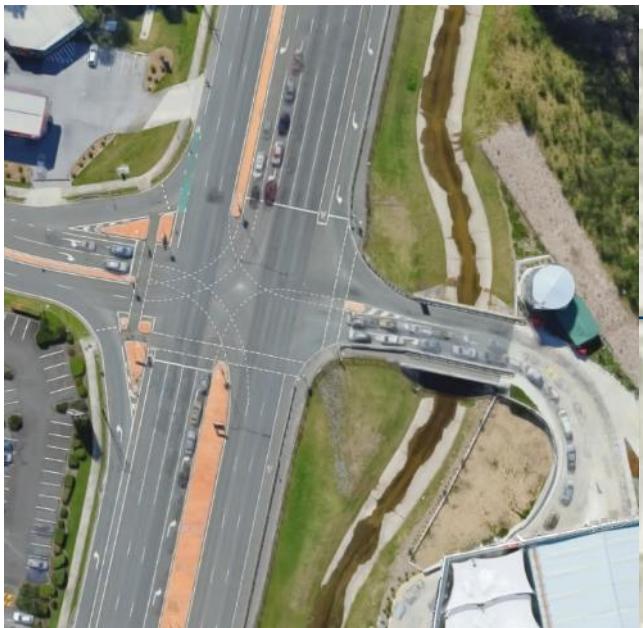


| TIA Item | Assessment |
|--|------------|
| Access and Frontage Impact Assessment and Mitigation | ✓ |



The development site proposes Channelised Right-turn (CHR) and Channelised Left-turn (CHL) lane treatments plus upgrade to existing signals to gain access to Bermuda Street

Step 5: Impact assessment and mitigation



| TIA Item | Assessment |
|---|------------|
| Intersection Delay Impact Assessment and Mitigation | ✓ |

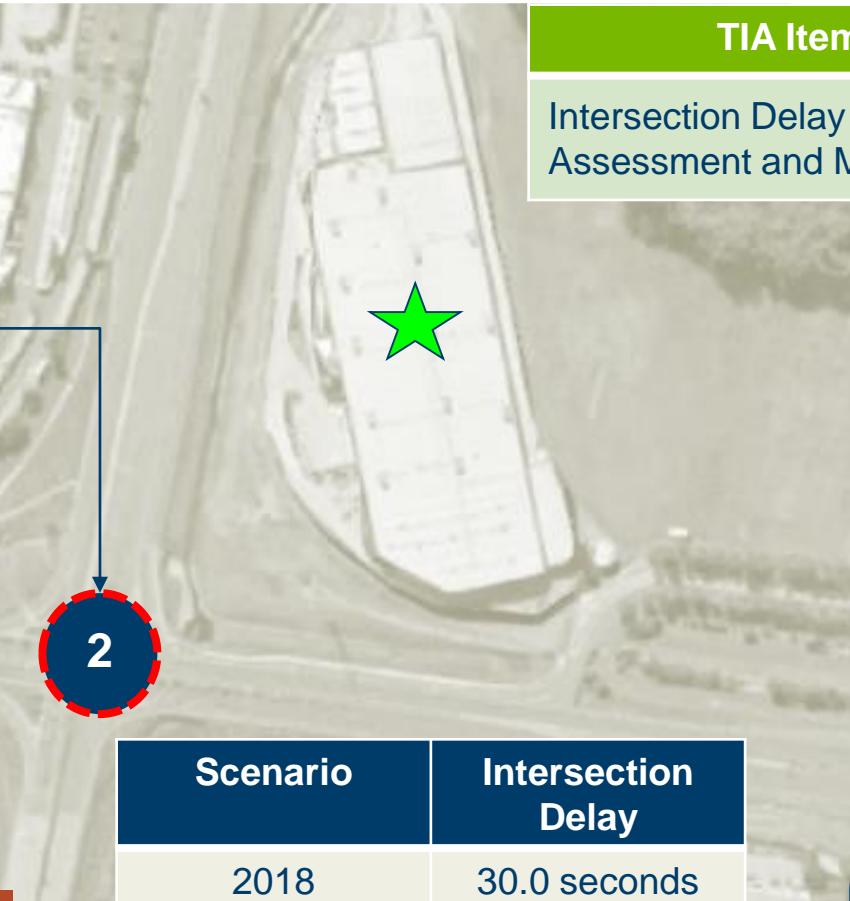


Access must operate within acceptable performance limits (degree of saturation, delay and queues) for a 10-year design horizon



| Scenario | Within Acceptable Limits? |
|-----------------------|---------------------------|
| 2018 With Development | ✓ |
| 2028 With Development | ✓ |

Step 5: Impact assessment and mitigation



| TIA Item | Assessment |
|---|------------|
| Intersection Delay Impact Assessment and Mitigation | ✓ |

SIDRA analysis required as development traffic is greater than 5% of 2018 background traffic on a number of movements

SI7

| Scenario | Intersection Delay |
|-----------------------|------------------------------|
| 2018 Background | 30.0 seconds |
| 2018 With Development | 36.0 seconds |
| Percentage difference | 20% increase in delay |

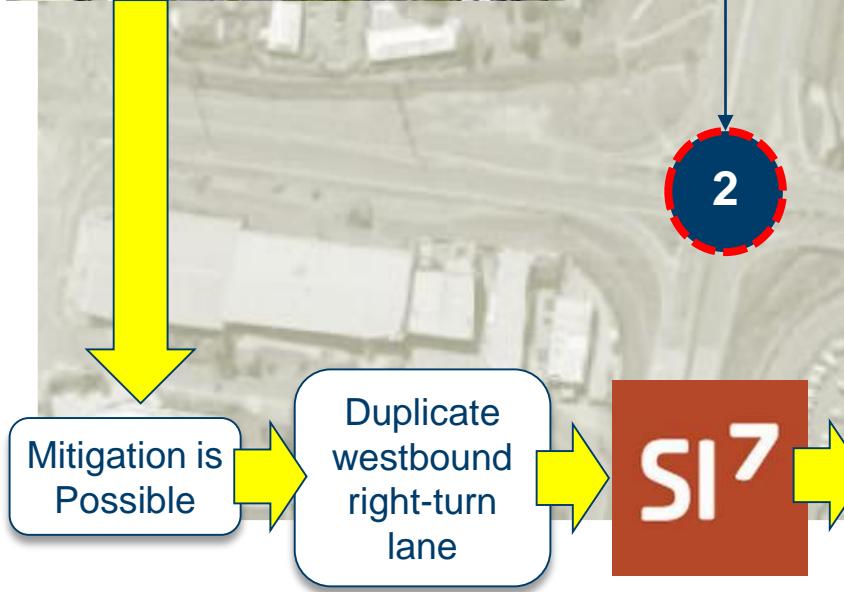
Delay Impact is > 5% Investigate “Avoid, Manage or Mitigate” options to reduce delay impact

Step 5: Impact assessment and mitigation



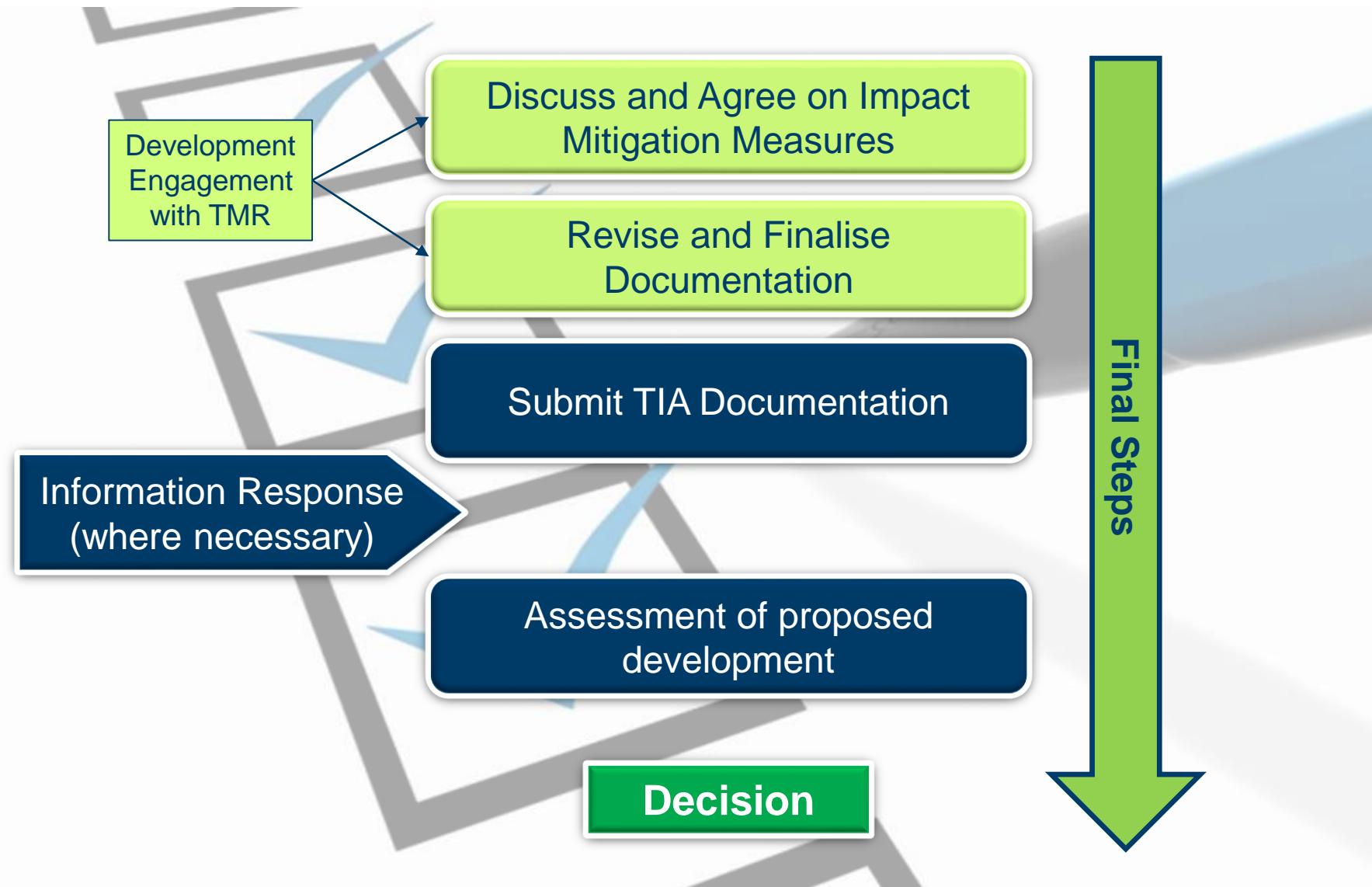
| Scenario | Intersection Delay |
|------------------------------------|-------------------------------|
| 2018 Background | 30.0 seconds |
| 2018 With Development + Mitigation | 28.0 seconds |
| Percentage difference | 7% <u>reduction</u> in delays |

Delay Impact is < 5% “no worsening” achieved



| TIA Item | Assessment |
|---|------------|
| Intersection Delay Impact Assessment and Mitigation | ✓ |

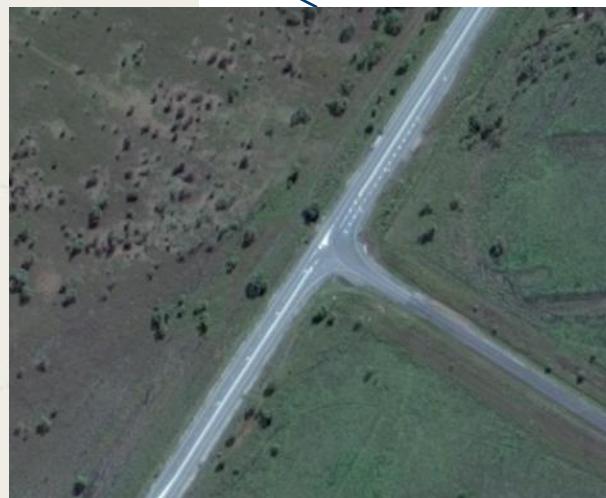
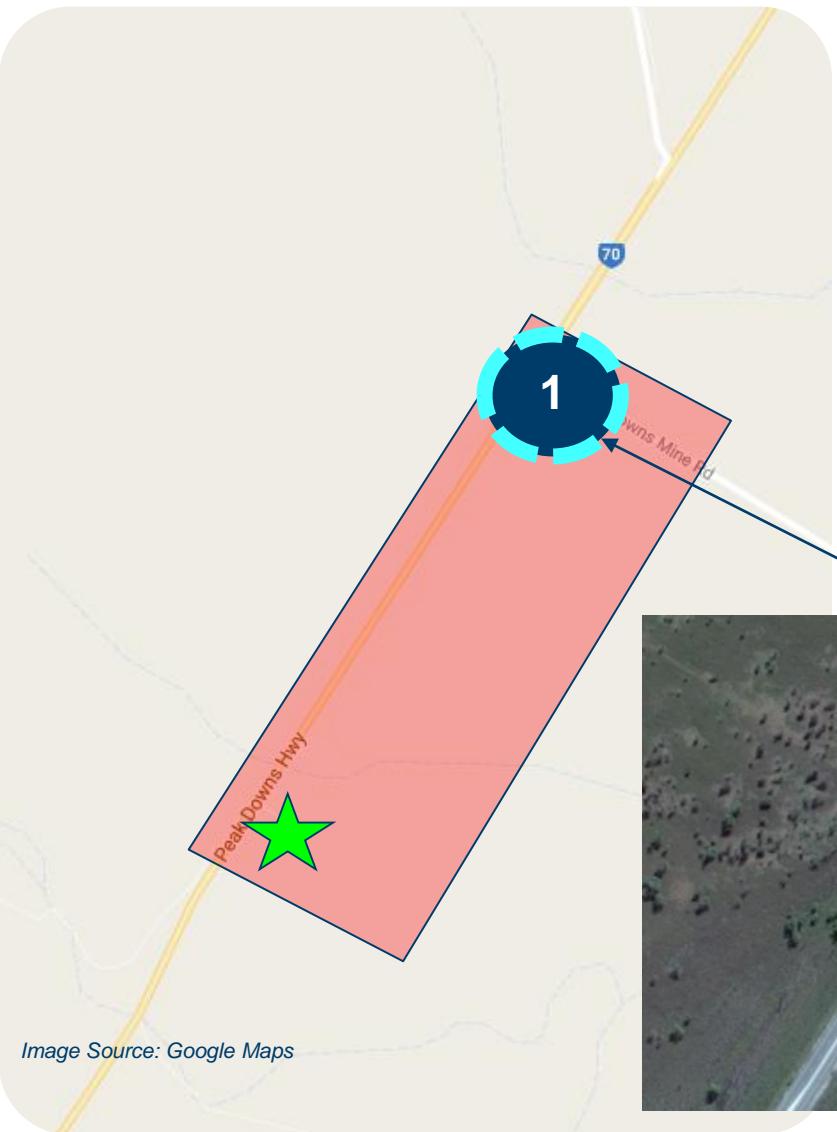
Impact mitigation measures, finalisation and submission



WORKED CASE STUDY

Case Study 3: Large quarry in rural area

Step 1: Introduction

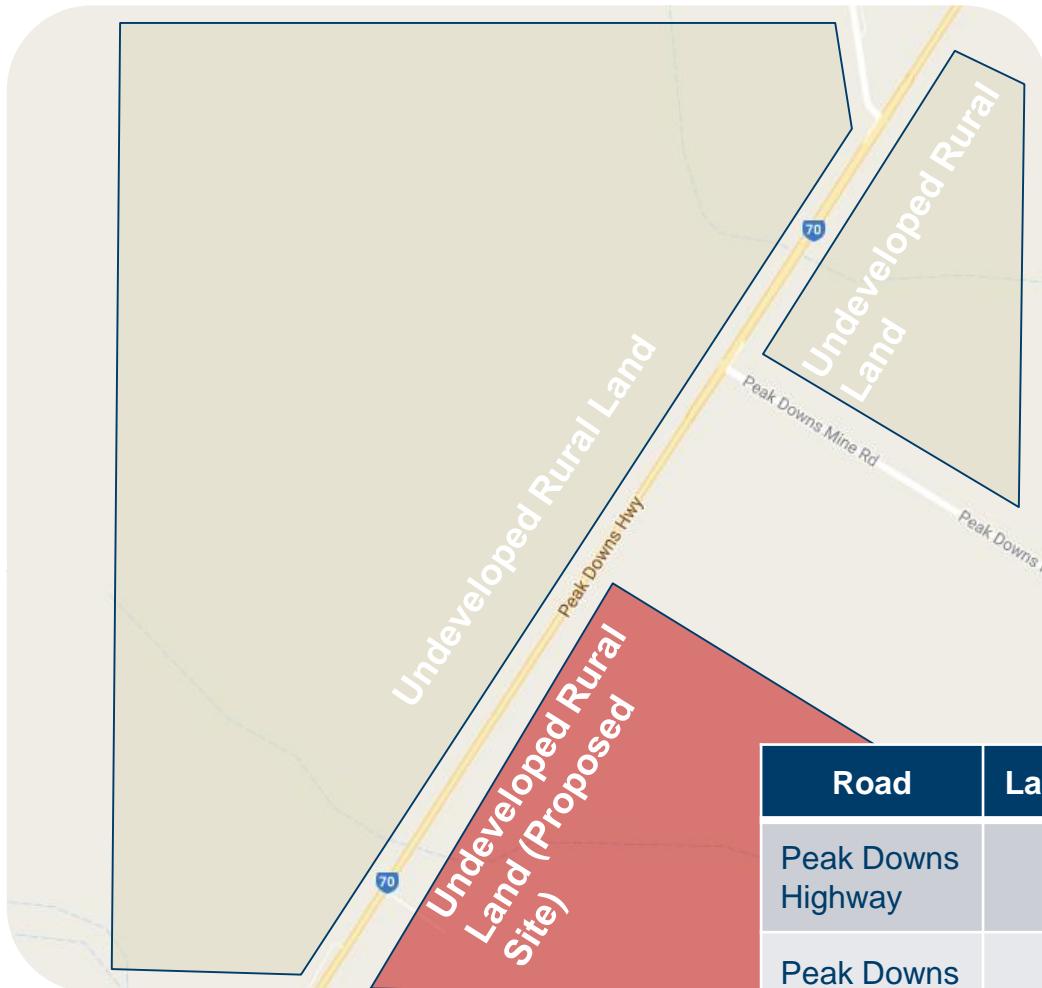


| TIA Item | Assessment |
|--|------------|
| Background Info | ✓ |
| Scope and Study Area | ✓ |
| Pre-lodgement Meeting Notes: - analysis required for the priority controlled Intersection 1 | |

Legend

- ★ Site Location
- Study Area
- Key Intersections

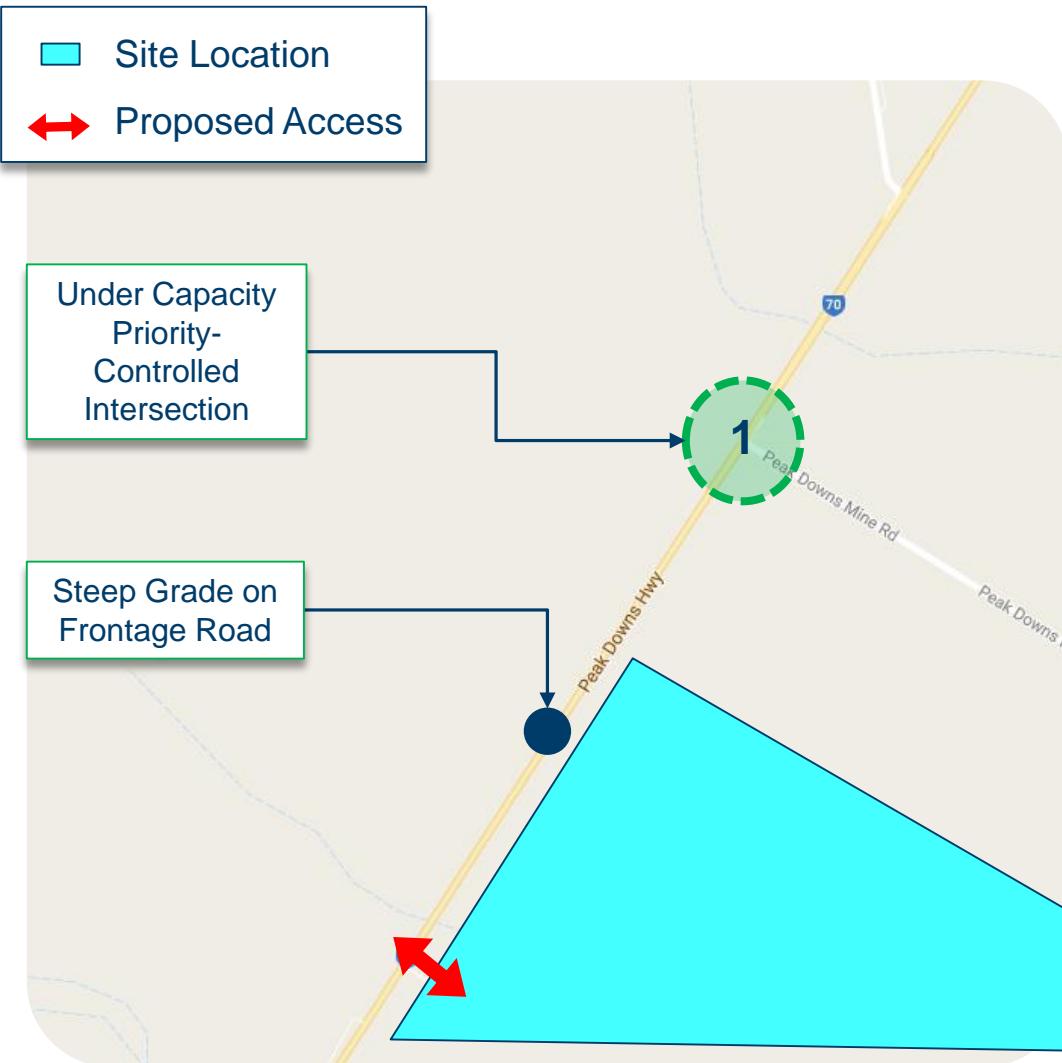
Step 2: Existing conditions



| TIA Item | Assessment |
|----------------------------------|------------|
| Land use and Zoning | ✓ |
| Adjacent Land Uses/ Approvals | ✓ |
| Surrounding Road Details | ✓ |

| Road | Lanes | Jurisdiction | Divided | Speed | Comment |
|----------------------|-------|--------------|---------|--------|---------------|
| Peak Downs Highway | 2 | TMR | No | 100kph | State Highway |
| Peak Downs Mine Road | 2 | Council | No | 80kph | |

Step 2: Existing conditions



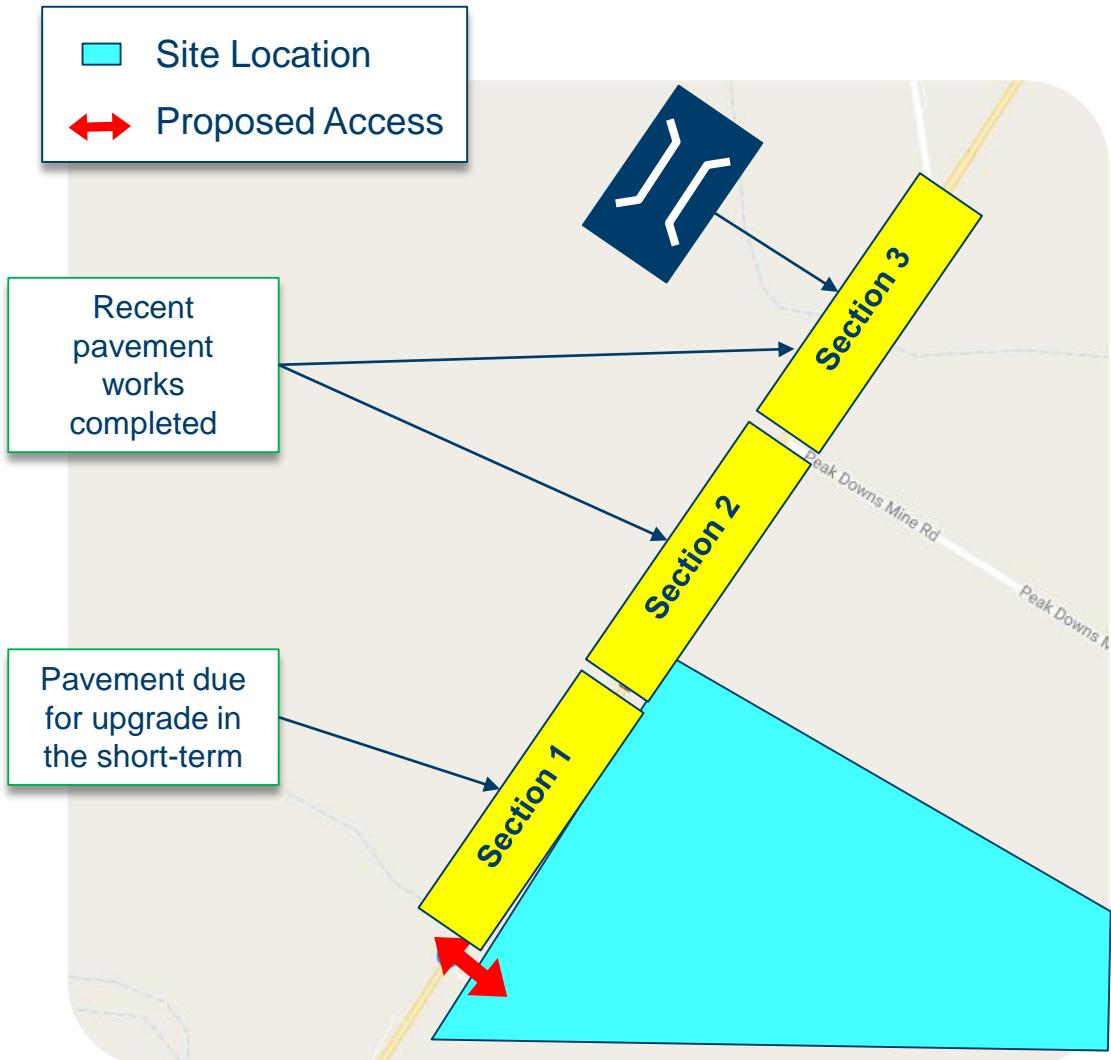
| TIA Item | Assessment |
|--------------------------------------|------------|
| Traffic Volumes | ✓ |
| Intersection and Network Performance | ✓ |
| Road Safety Issues | ✓ |
| Site Access | ✓ |

Notes:

- No current road safety issues;
- Recent traffic survey data used;
- Steep grade on frontage road to the north of the site.

| Intersection | Recent Data Available? |
|--------------|------------------------|
| 1 | Yes (2015 Data) |

Step 2: Existing conditions



| TIA Item | Assessment |
|--------------------------|------------|
| Public Transport | NA |
| Active Transport | NA |
| Parking | NA |
| Pavement | ✓ |
| Transport Infrastructure | ✓ |

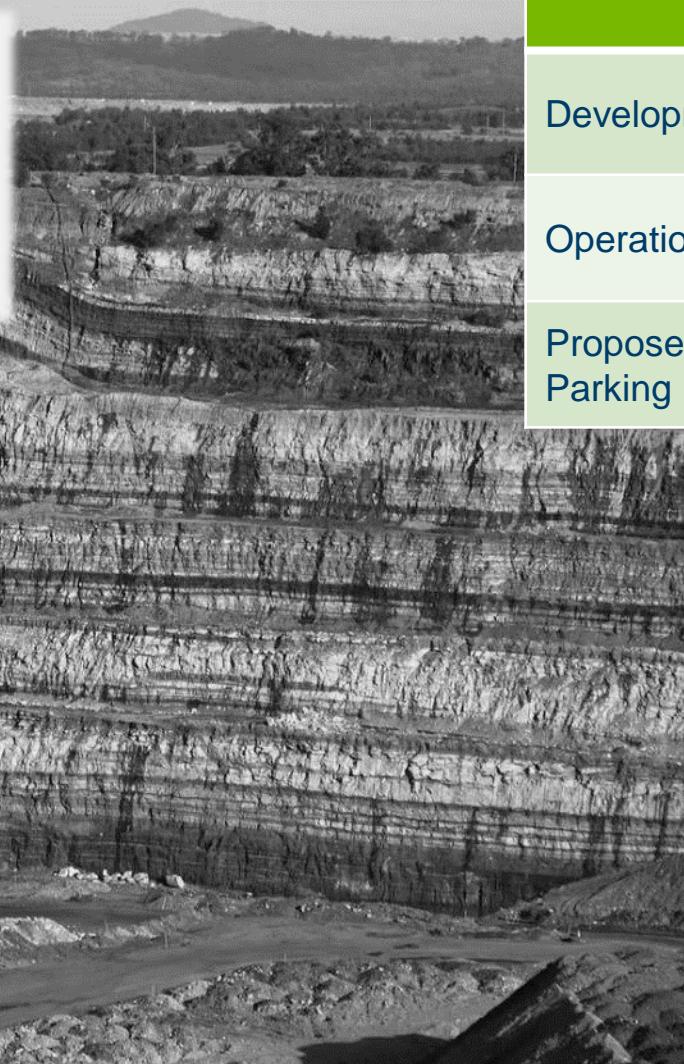
Notes:

- Historic bridge to the north of the site;
- Three key pavement sections.

Step 3: Proposed development details

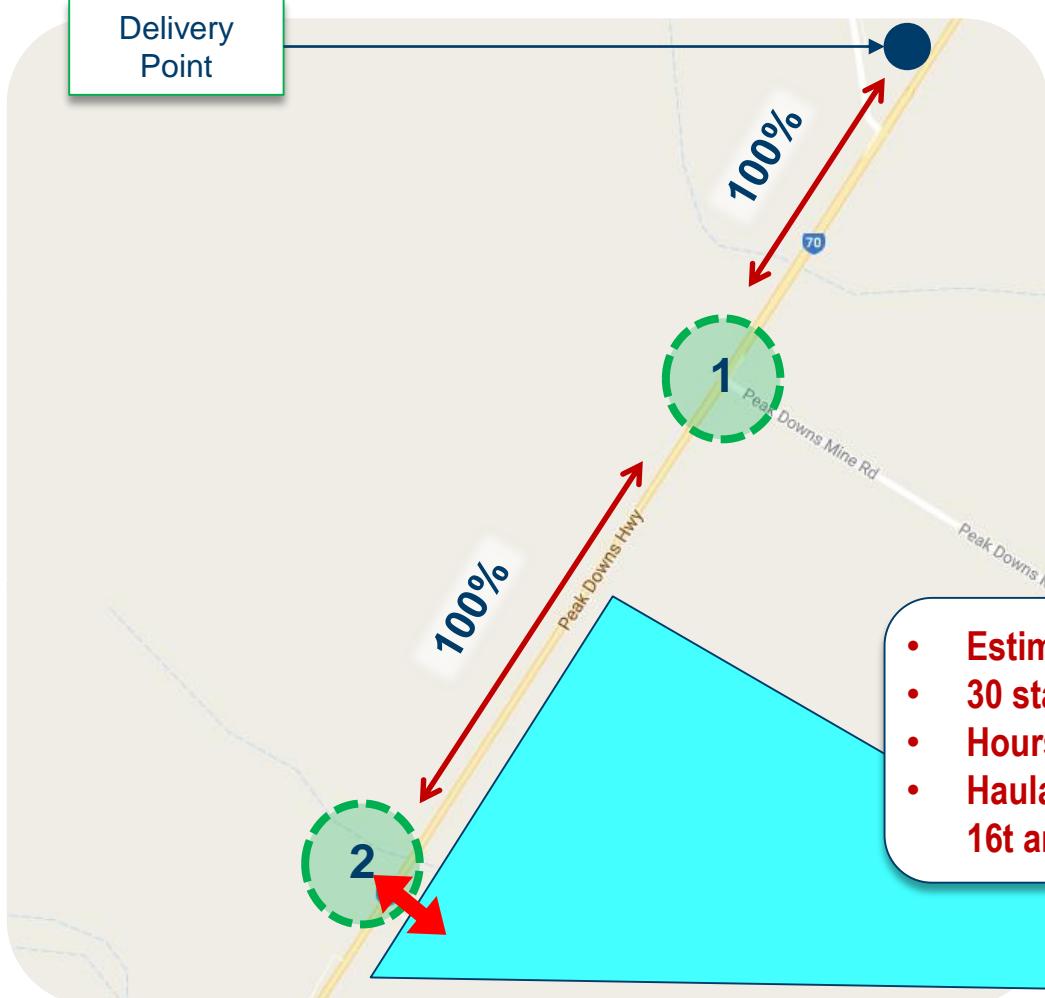


- ❖ Quarry Development
- ❖ 2019 Year of Construction
- ❖ 2022 Year of Opening
- ❖ 20-year Operational Life
- ❖ Access on State-Controlled Road



| TIA Item | Assessment |
|-----------------------------|------------|
| Development Site Plan | ✓ |
| Operational Details | ✓ |
| Proposed Access and Parking | ✓ |

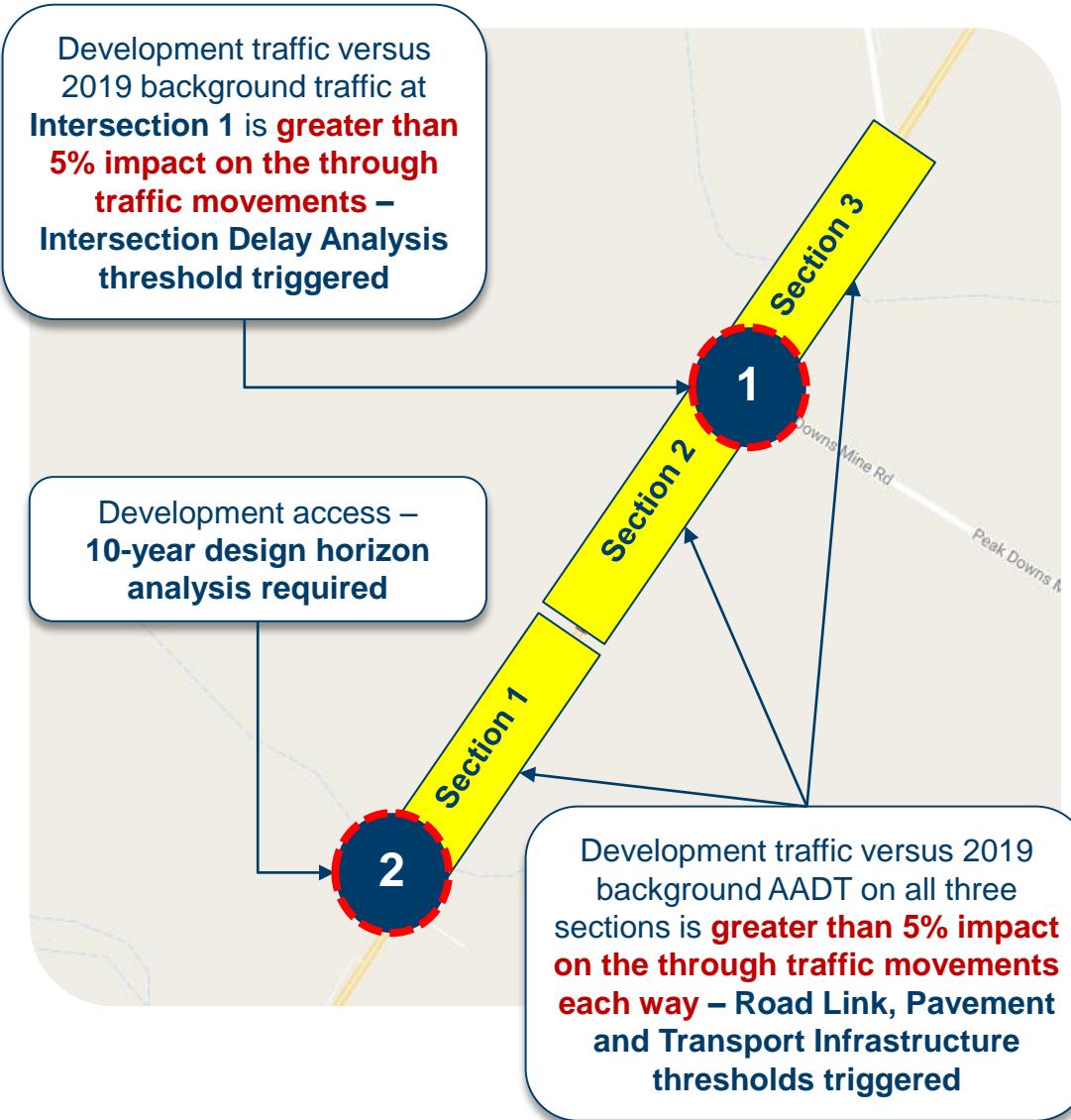
Step 4: Development traffic



| TIA Item | Assessment |
|--|------------|
| Development Traffic Volumes on Network | ✓ |
| Notes: Distribution is based on: - <i>Delivery point</i> | |

- Estimated quarry output = 250,000 tonnes / year
- 30 staff present during construction and operation phases
- Hours of operation = 6am to 6pm, Monday to Friday
- Haulage via 42.5t GVM tri-axle semi tippers with a tare of 16t and net payload weight of 26.5t

Step 5: Impact assessment and mitigation



| TIA Item | Assessment |
|--------------------------------------|-------------|
| With and Without Development Traffic | ✓ |
| TIA Aspect | Assessable? |
| Construction Impact | YES |
| Road Safety Impact | YES |
| Access and Frontage Impact | YES |
| Intersection Delay Impact | YES |
| Road Link Capacity | YES |
| Pavement Impact | YES |
| Transport Infrastructure Impact | YES |

Step 5: Impact assessment and mitigation

| Risk Item | Without Development | | | With Development | | |
|---|---------------------------------------|-------------------------------|-------------|------------------|-------------|--------|
| | Likelihood | Consequence | Result | Likelihood | Consequence | Result |
| Southbound left-turn vehicles at the site access slowing to execute turn on high-speed road | 1 | 1 | L | 5 | 2 | M |
| Right turn movements from the site onto a high-speed road | 1 | 1 | L | 5 | 2 | M |
| Risk Item | Mitigation | With Development + Mitigation | | | | |
| | | Likelihood | Consequence | Result | | |
| Southbound left-turn vehicles at the site access slowing to execute turn on high-speed road | Channelised left-turn lane | 1 | 2 | L | | |
| Right turn movements from the site onto a high-speed road | Upgrade access to a seagull treatment | 1 | 2 | L | | |
| TIA Item | | | | Assessment | | |
| Road Safety Impact Assessment and Mitigation | | | | ✓ | | |

Step 5: Impact assessment and mitigation

| Traffic Volume (AADT) | Speed (kph) | | |
|--------------------------|-------------|----------------|---------|
| | Up to 50kph | 60kph to 70kph | 80kph + |
| ≤ 8000 | Low | Medium | Medium |
| ≥ 8000 | Medium | Medium | High |

SCR Traffic Volumes ≤ 8000

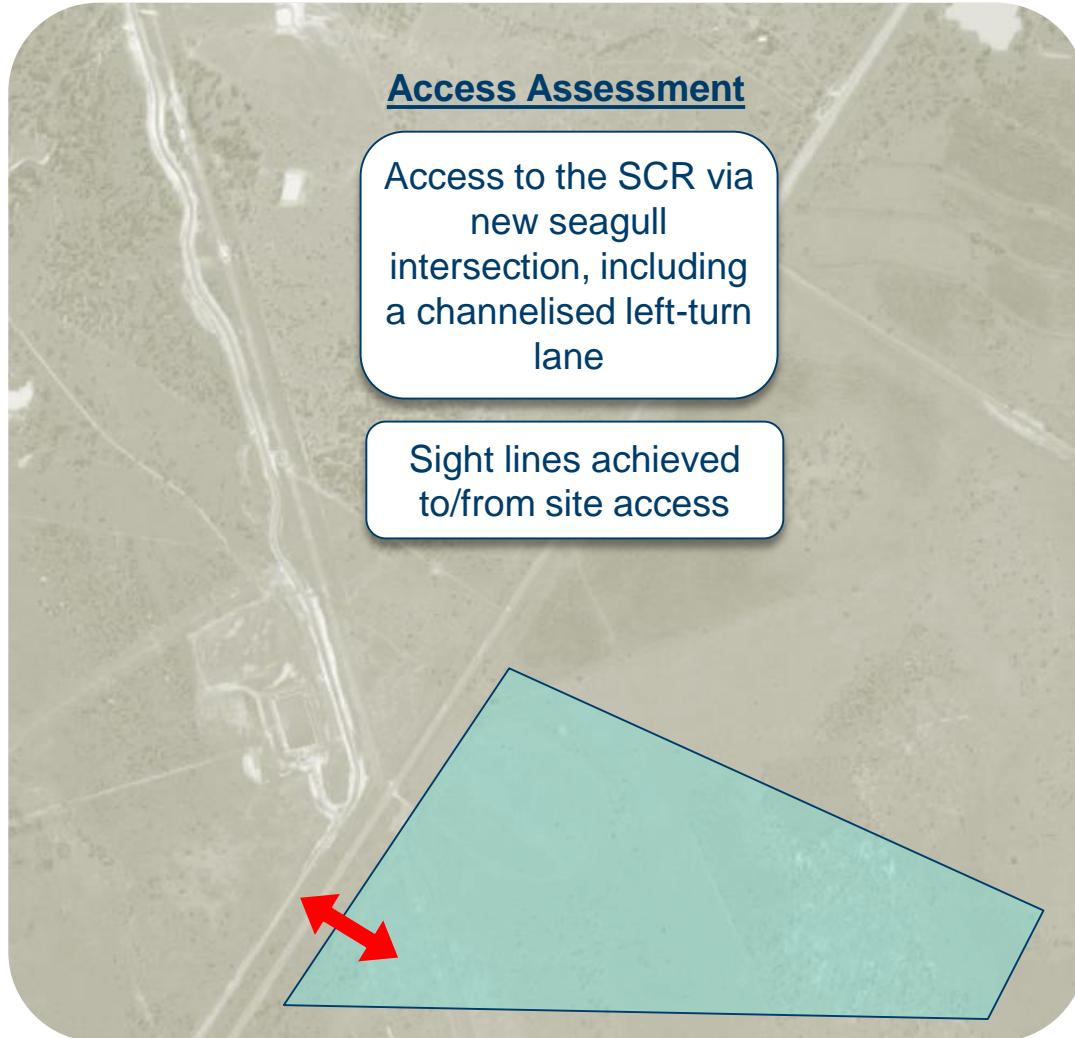
SCR Speed Limit 100kph

| TIA Item | Assessment |
|--|------------|
| Road Safety Impact Assessment and Mitigation | ✓ |

| Development Type | Road Environment Safety Rating | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| | Low | Medium | High |
| Major Development | Road Safety Assessment | Road Safety Audit | Road Safety Audit |
| Planning Act Development | Road Safety Assessment | Road Safety Assessment | Road Safety Audit |

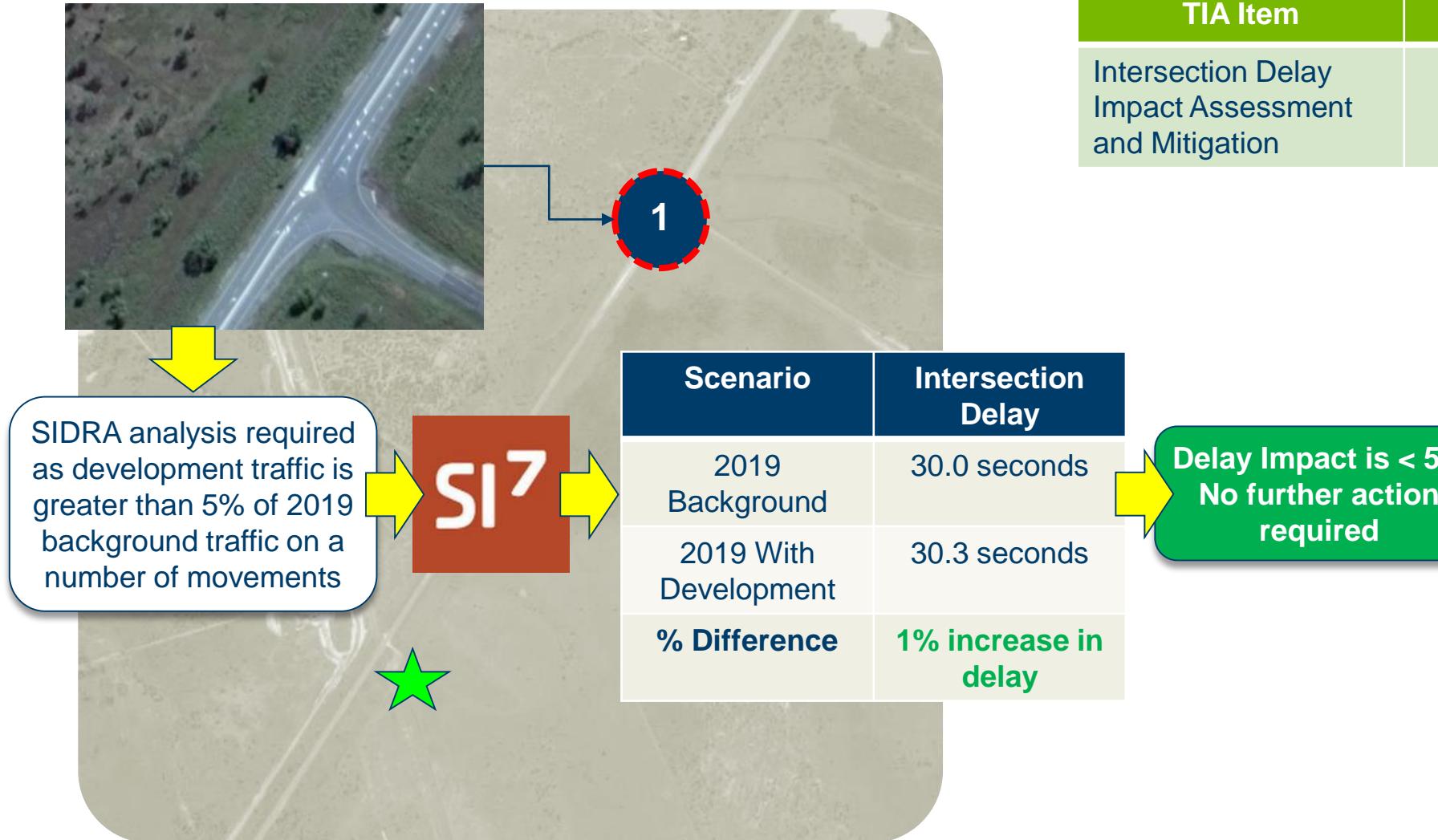
A Road Safety Audit is required to be undertaken for the proposed access upgrade works

Step 5: Impact assessment and mitigation



| TIA Item | Assessment |
|--|------------|
| Access and Frontage Impact Assessment and Mitigation | ✓ |

Step 5: Impact assessment and mitigation



| TIA Item | Assessment |
|---|------------|
| Intersection Delay Impact Assessment and Mitigation | ✓ |

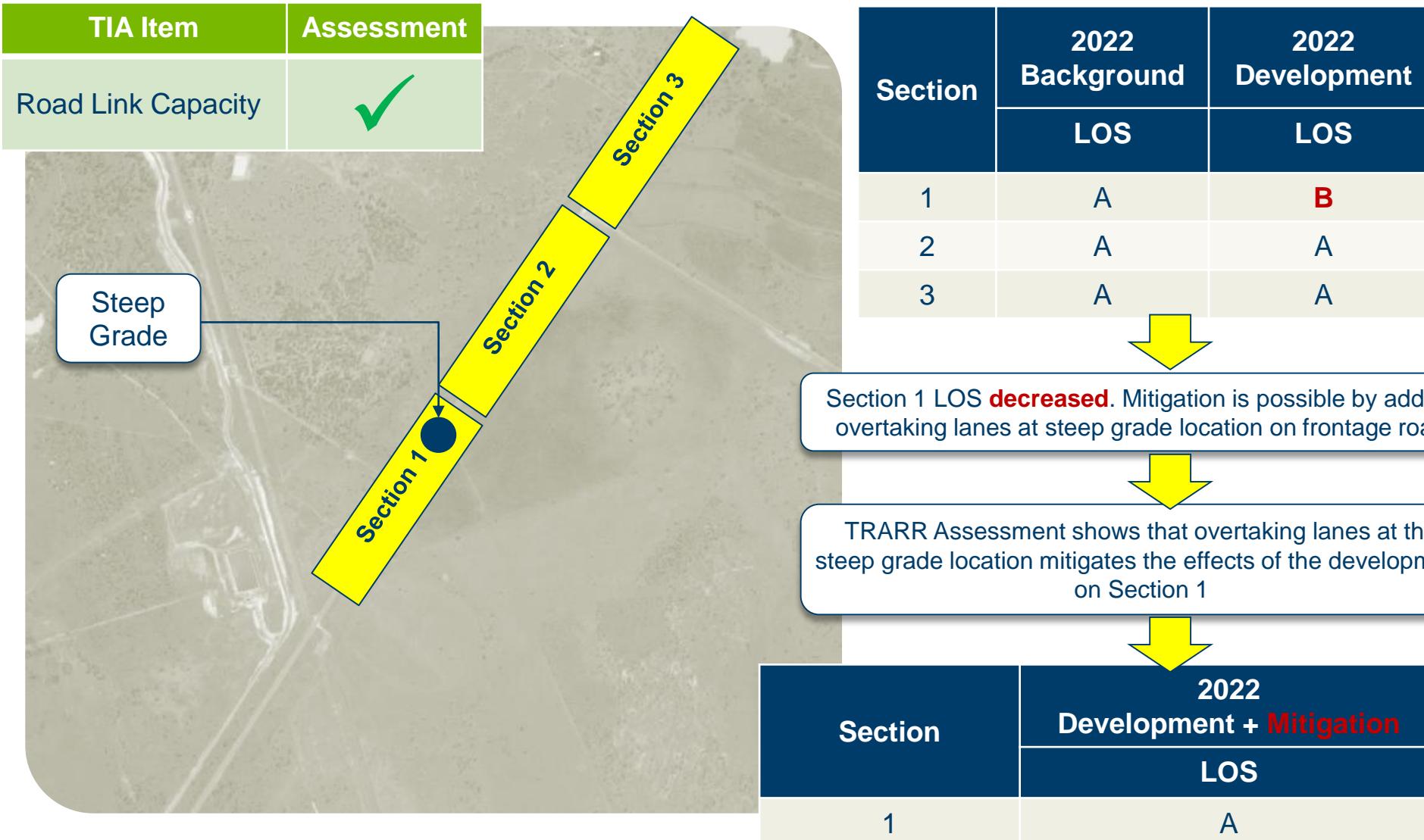
Step 5: Impact assessment and mitigation



| TIA Item | Assessment |
|---|------------|
| Intersection Delay Impact Assessment and Mitigation | ✓ |

| Scenario | Within Acceptable Limits? |
|-----------------------|---------------------------|
| 2019 With Development | ✓ |
| 2029 With Development | ✓ |

Step 5: Impact assessment and mitigation



Step 5: Impact assessment and mitigation

```

graph TD
    A[SCR Traffic Volumes ≤ 8000] --> TIA1[Road Safety Impact Assessment and Mitigation]
    B[SCR Speed Limit 100kph] --> TIA1
    C[SCR Traffic Volumes ≥ 8000] --> TIA2[Road Environment Safety Rating]
    D[SCR Speed Limit 100kph] --> TIA2
    
```

The flowchart shows two boxes at the bottom left pointing to the first table (TIA Item) and the second table (Road Environment Safety Rating). The first box contains "SCR Traffic Volumes ≤ 8000" and the second box contains "SCR Speed Limit 100kph". Arrows from both boxes point upwards to the respective tables.

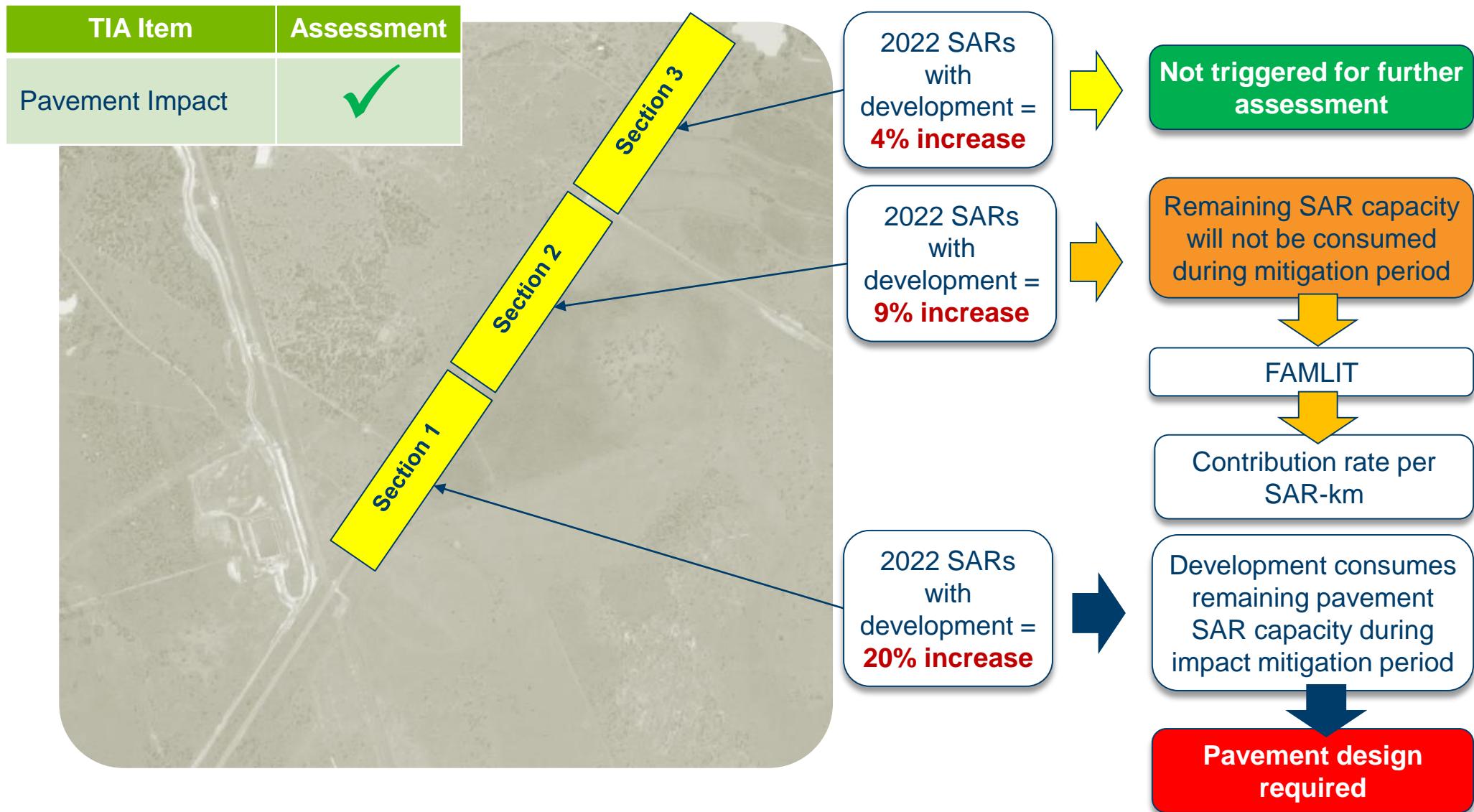
| Traffic Volume (AADT) | Speed (kph) | | |
|-----------------------|-------------|----------------|---------|
| | Up to 50kph | 60kph to 70kph | 80kph + |
| ≤ 8000 | Low | Medium | Medium |
| ≥ 8000 | Medium | Medium | High |

| TIA Item | Assessment |
|--|------------|
| Road Safety Impact Assessment and Mitigation | ✓ |

| Development Type | Road Environment Safety Rating | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| | Low | Medium | High |
| Major Development | Road Safety Assessment | Road Safety Audit | Road Safety Audit |
| Planning Act Development | Road Safety Assessment | Road Safety Assessment | Road Safety Audit |

A Road Safety Audit is required to be undertaken for the proposed overtaking lanes

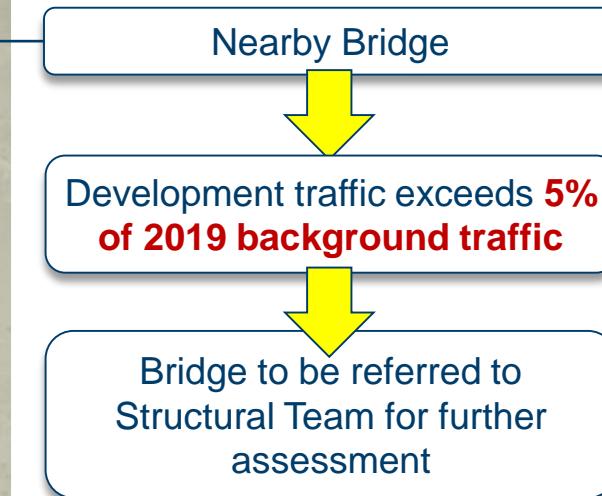
Step 5: Impact assessment and mitigation



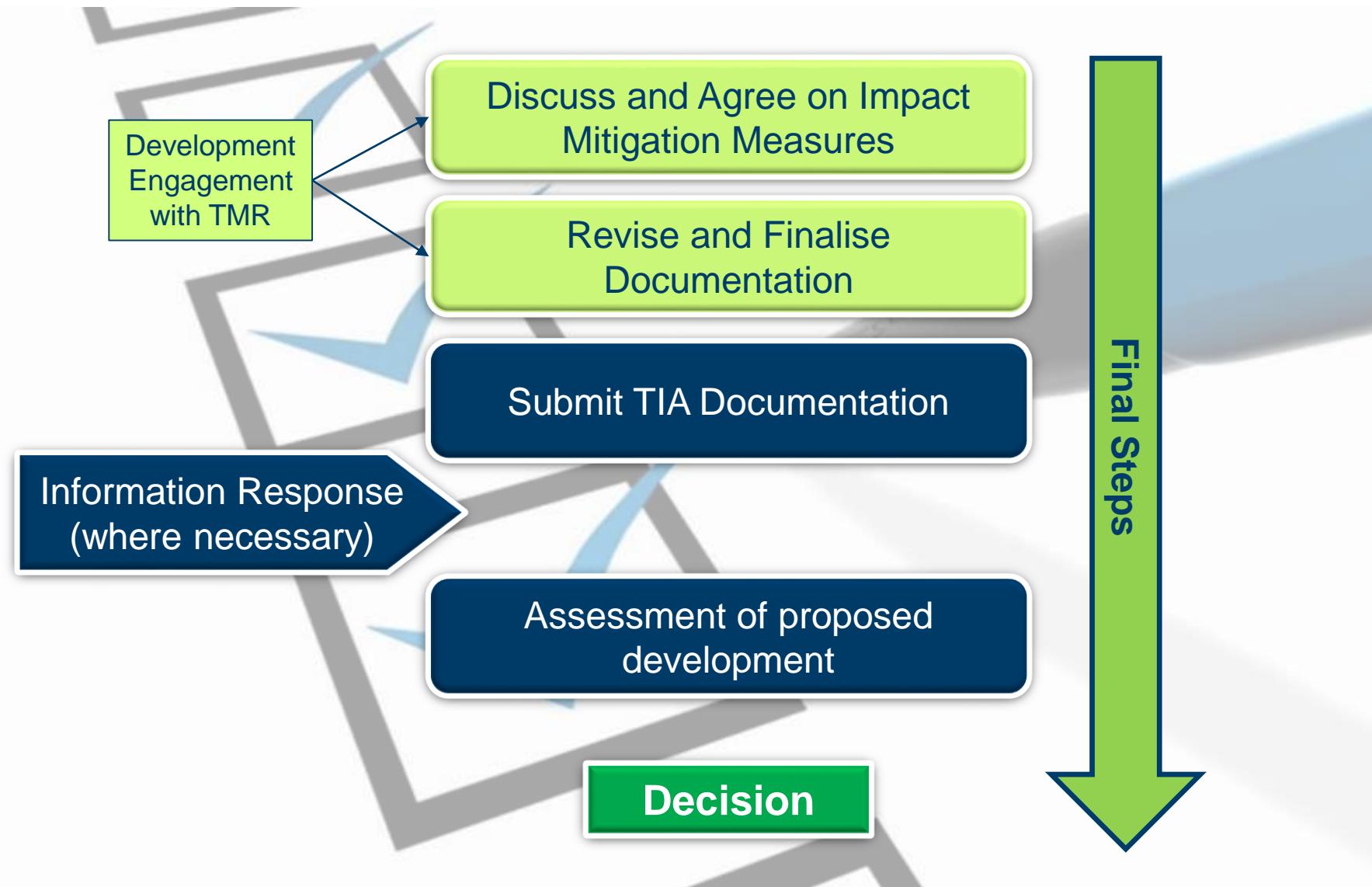
Step 5: Impact assessment and mitigation



| TIA Item | Assessment |
|--------------------------|------------|
| Transport Infrastructure | ✓ |



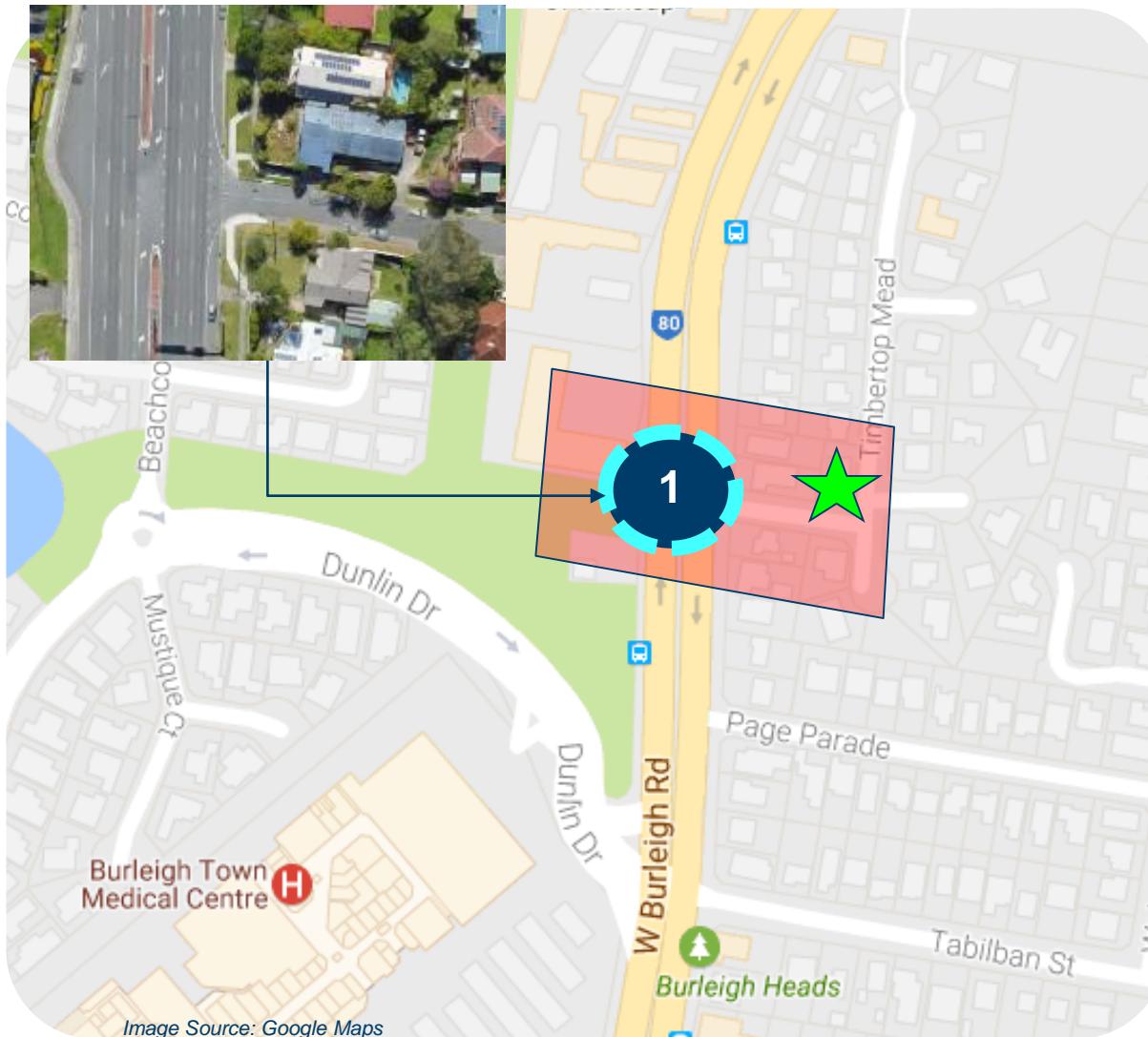
Impact mitigation measures, finalisation and submission



WORKED CASE STUDY

Case Study 4: Small residential development in under capacity road network

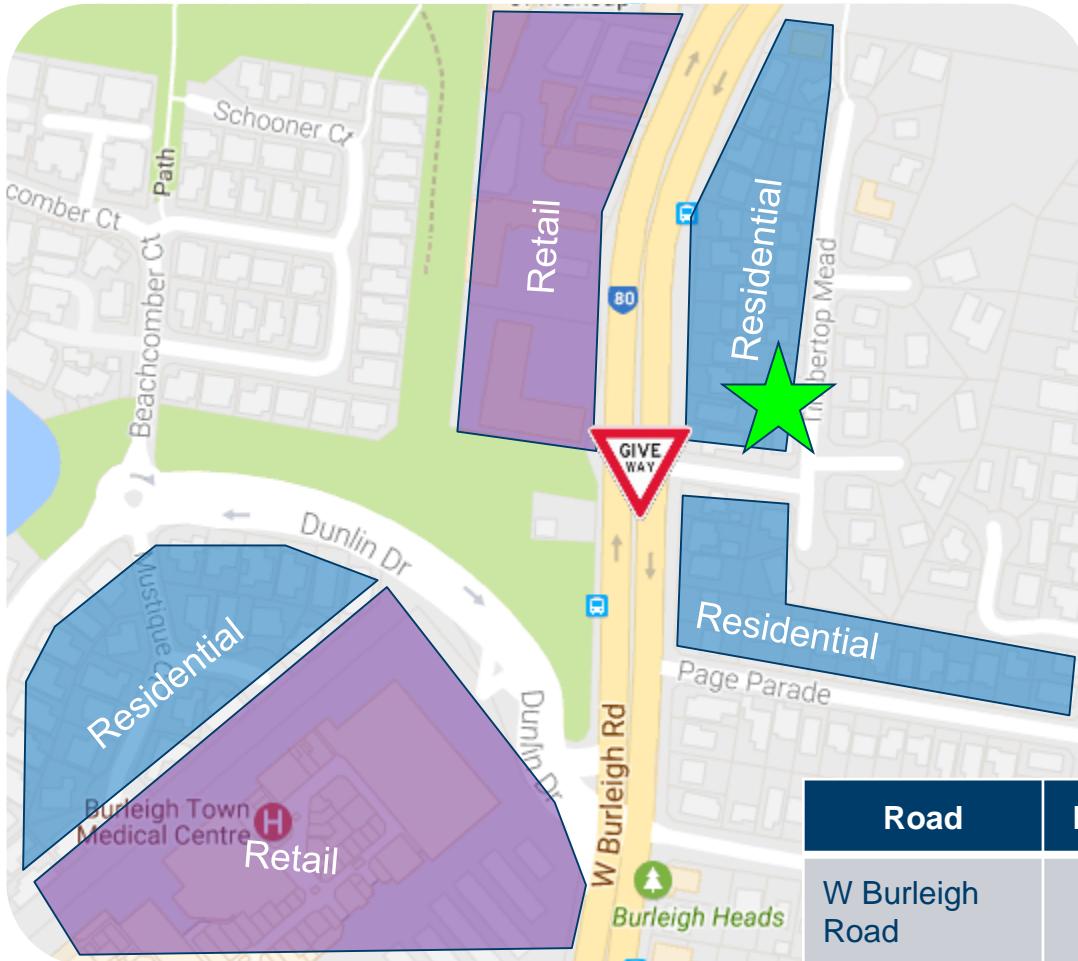
Step 1: Introduction



| TIA Item | Assessment |
|---|------------|
| Background Info | ✓ |
| Scope and Study Area | ✓ |
| Pre-lodgement Meeting Notes: - site is 20m from a state-controlled road - no major transport impacts expected | |

| Legend | |
|--------|-------------------|
| ★ | Site Location |
| ● | Study Area |
| ○ | Key Intersections |

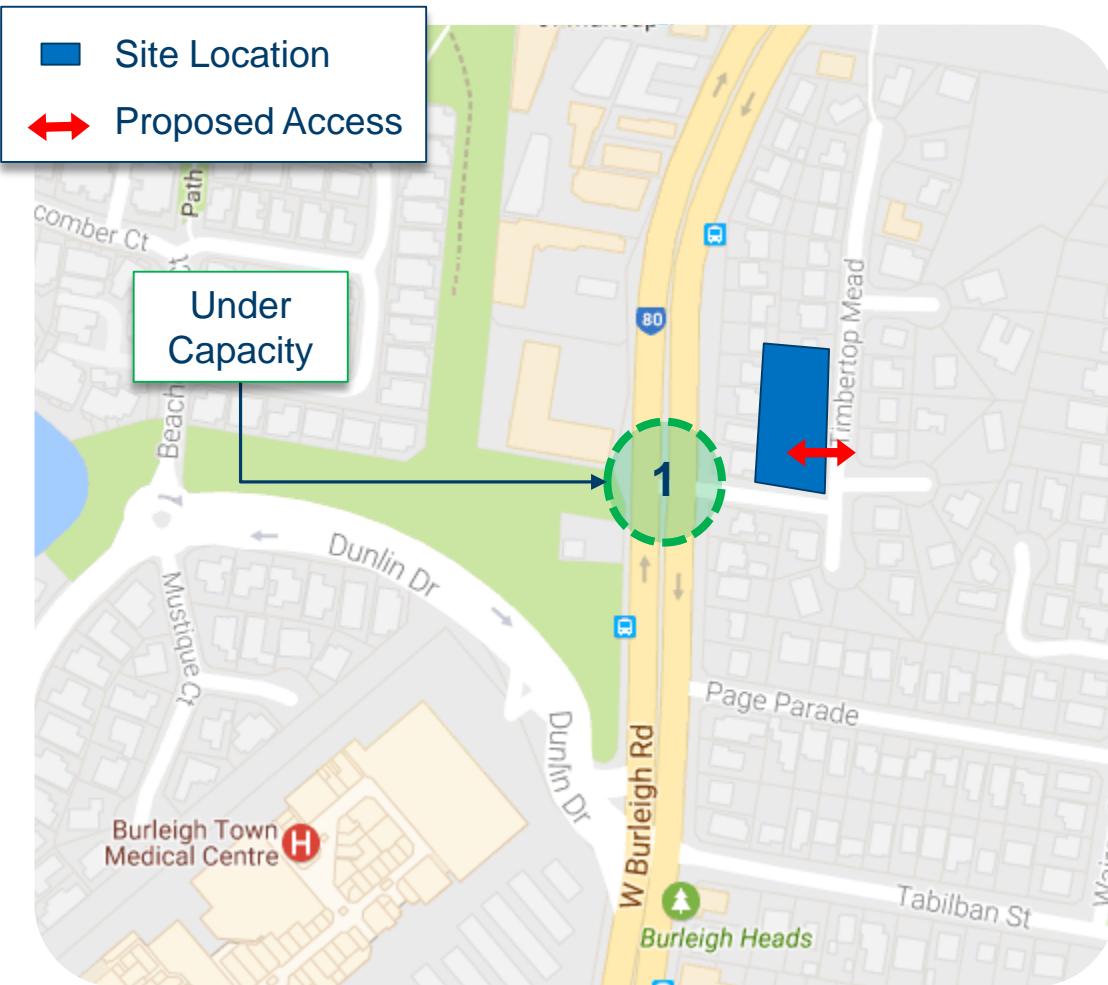
Step 2: Existing conditions



| Road | Lanes | Jurisdiction | Divided | Speed | Comment |
|-----------------|-------|--------------|---------|-------|----------------|
| W Burleigh Road | 6 | TMR | Yes | 70kph | Major Arterial |
| Timbertop Mead | 2 | Council | No | 50kph | Local |

| TIA Item | Assessment |
|------------------------------|------------|
| Land use and Zoning | ✓ |
| Adjacent Land Uses/Approvals | ✓ |
| Surrounding Road Details | ✓ |

Step 2: Existing conditions



| TIA Item | Assessment |
|--------------------------------------|------------|
| Traffic Volumes | ✓ |
| Intersection and Network Performance | ✓ |
| Road Safety Issues | ✓ |
| Site Access | ✓ |

Notes:

- No current road safety issues;
- Recent traffic survey data used.

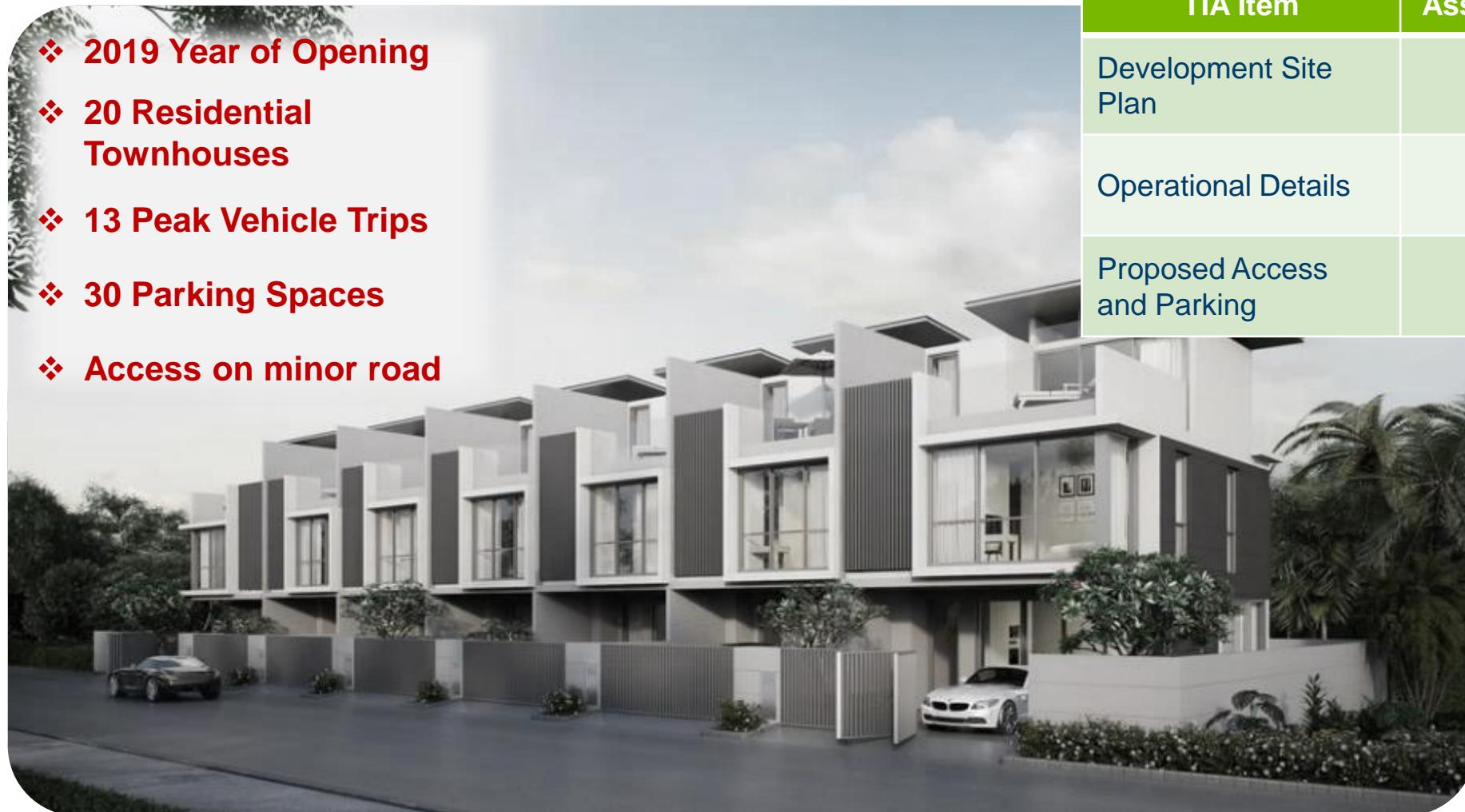
| Intersection | Recent Data Available? |
|--------------|------------------------|
| 1 | Yes (2015 Data) |

Step 2: Existing conditions



| TIA Item | Assessment |
|--------------------------|------------|
| Public Transport | ✓ |
| Active Transport | ✓ |
| Parking | ✓ |
| Pavement | NA |
| Transport Infrastructure | NA |

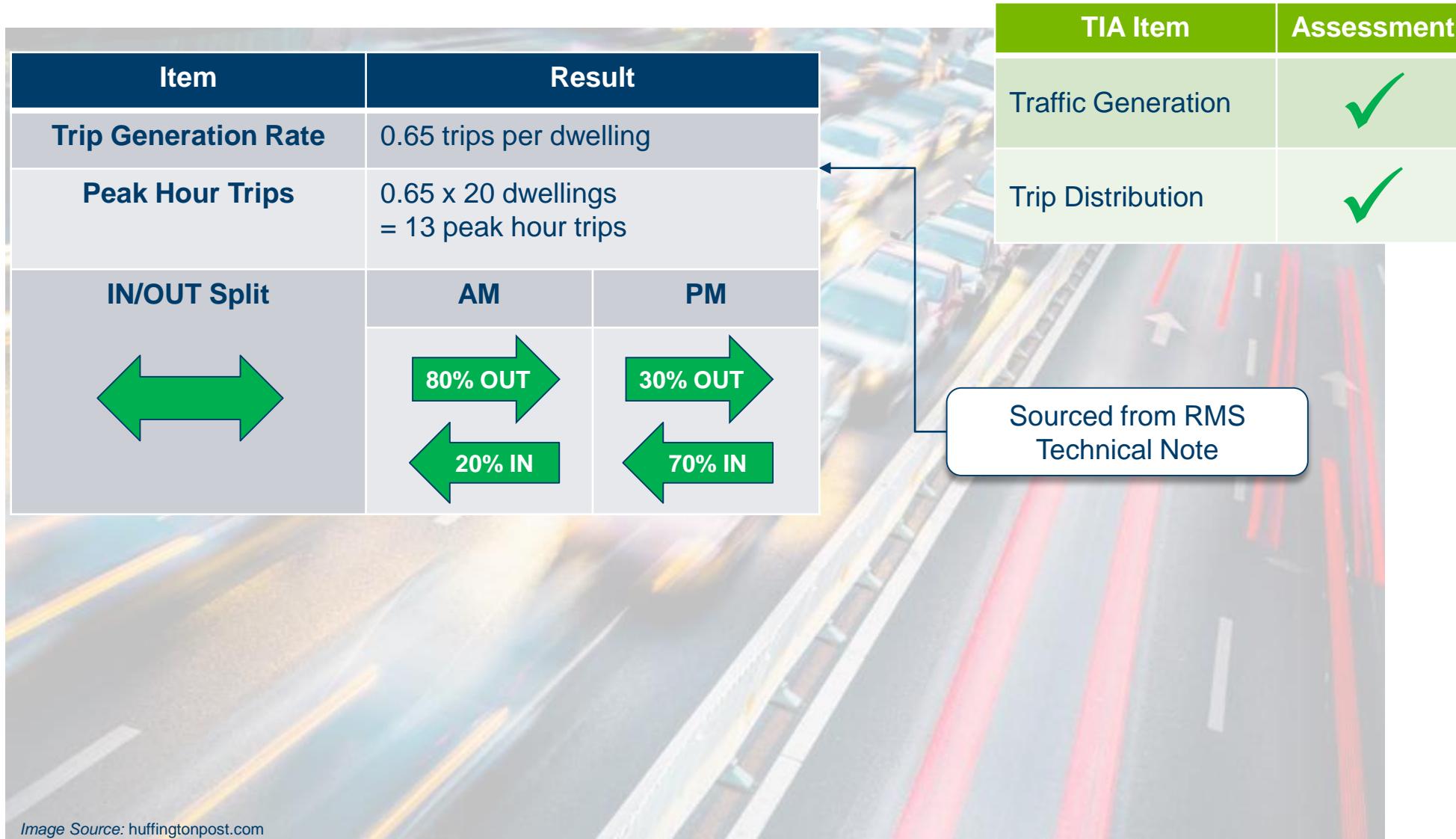
Step 3: Proposed development details



- ❖ 2019 Year of Opening
- ❖ 20 Residential Townhouses
- ❖ 13 Peak Vehicle Trips
- ❖ 30 Parking Spaces
- ❖ Access on minor road

| TIA Item | Assessment |
|-----------------------------|------------|
| Development Site Plan | ✓ |
| Operational Details | ✓ |
| Proposed Access and Parking | ✓ |

Step 4: Development traffic



| Item | Result | | TIA Item | Assessment | | | | |
|----------------------|---|--|--------------------|------------|-------------------|-------------------|---------------------------------|--|
| Trip Generation Rate | 0.65 trips per dwelling | | Traffic Generation | ✓ | | | | |
| Peak Hour Trips | $0.65 \times 20 \text{ dwellings} = 13 \text{ peak hour trips}$ | | Trip Distribution | ✓ | | | | |
| IN/OUT Split | <table><thead><tr><th>AM</th><th>PM</th></tr></thead><tbody><tr><td>80% OUT 20% IN</td><td>30% OUT 70% IN</td></tr></tbody></table> | | AM | PM | 80% OUT 20% IN | 30% OUT 70% IN | Sourced from RMS Technical Note | |
| AM | PM | | | | | | | |
| 80% OUT 20% IN | 30% OUT 70% IN | | | | | | | |

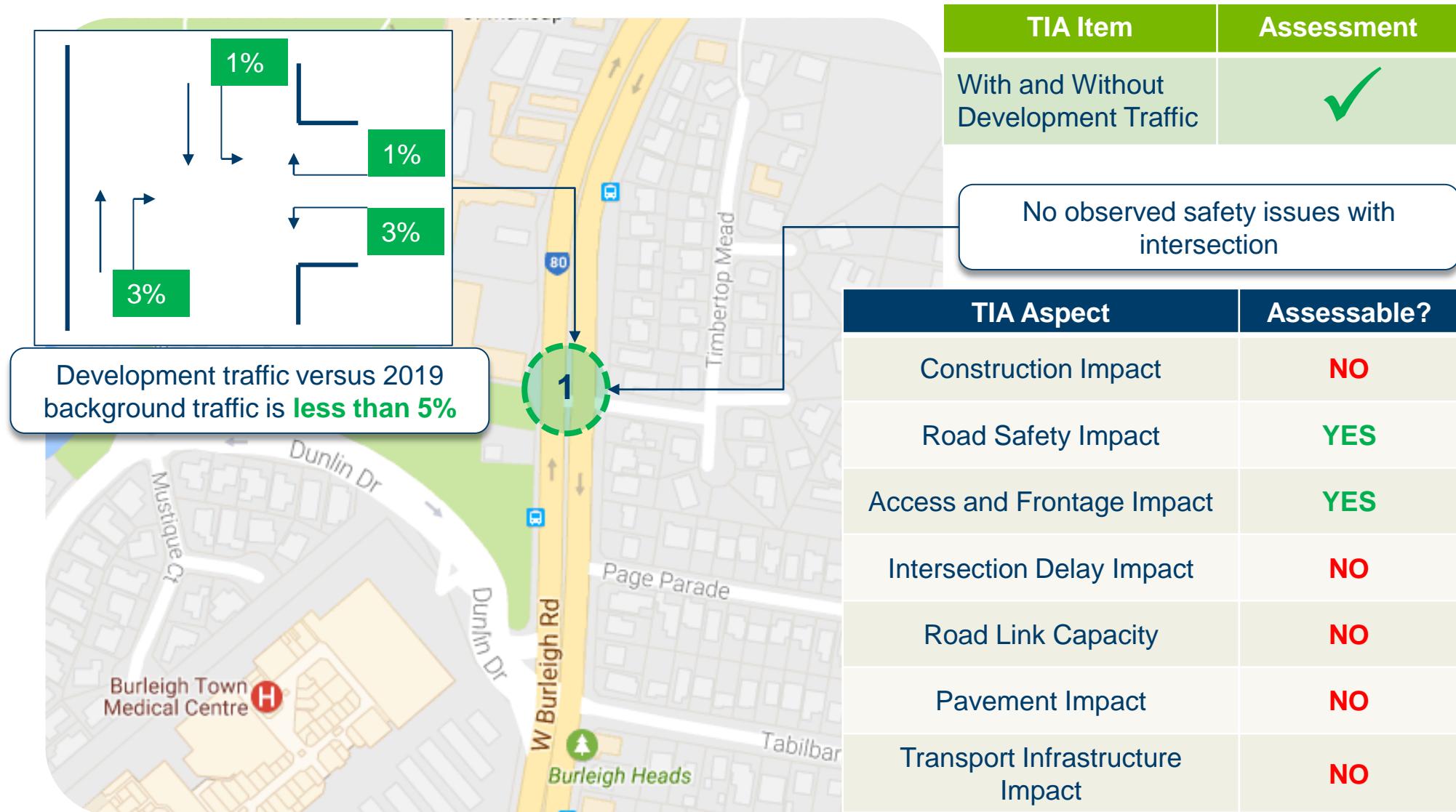
Image Source: huffingtonpost.com

Step 4: Development traffic



| TIA Item | Assessment |
|---|------------|
| Development Traffic Volumes on Network Notes: Distribution is based on: ❖ <i>Traffic Survey Data</i> ❖ <i>Local Knowledge</i> | ✓ |

Step 5: Impact assessment and mitigation

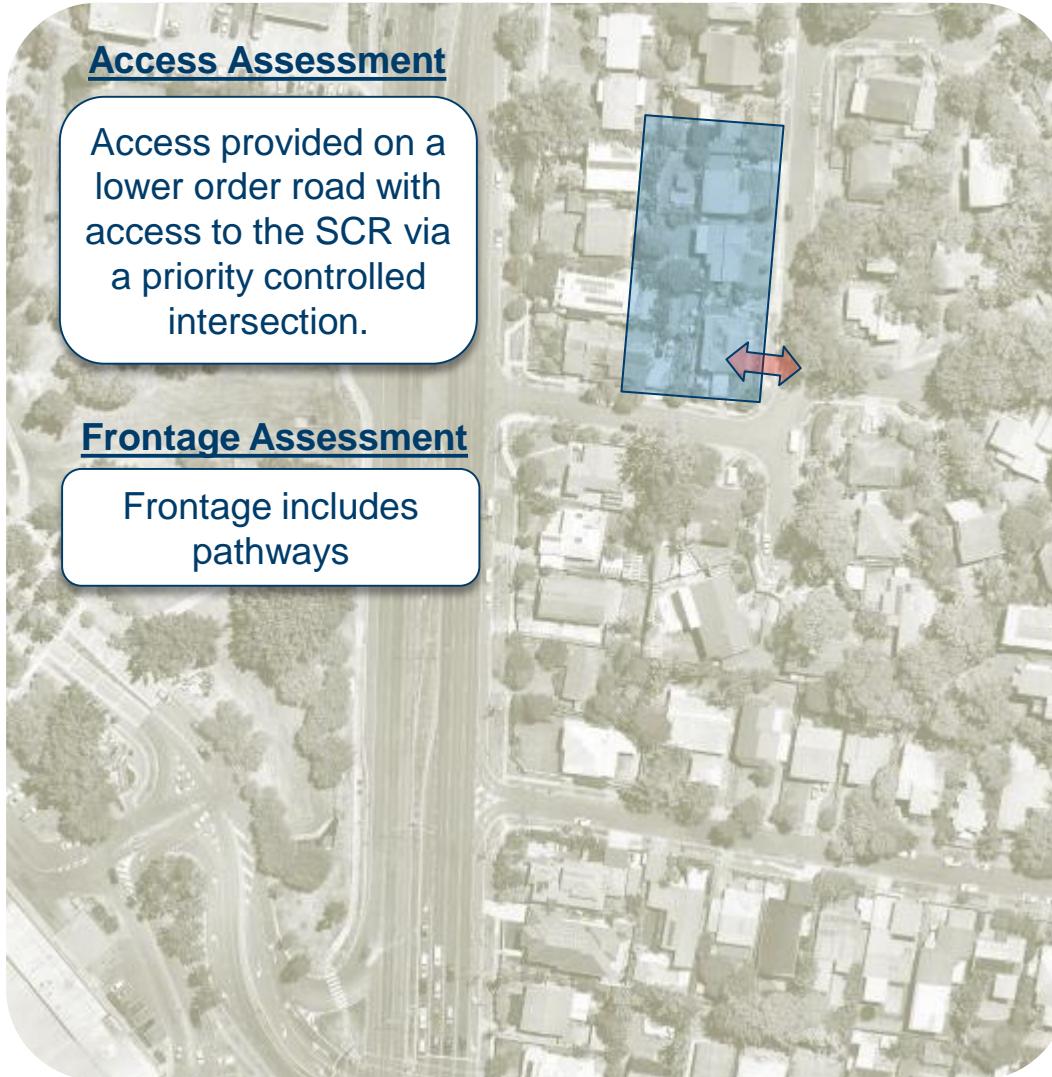


Step 5: Impact assessment and mitigation

| Risk Item | Without Development | | | With Development | | |
|--|---------------------|-------------|--------|------------------|-------------|--------|
| | Likelihood | Consequence | Result | Likelihood | Consequence | Result |
| Development results in a small increase in northbound right-turn traffic demand at Intersection 1. Peak hour site observations indicate that queueing in this turn lane is currently low (i.e. 1-2 vehicles at any given time) and the storage length is long (approx. 70m or 10 vehicle lengths). The catchment served by this turn lane is 'closed' and has limited future development potential. Therefore, the risk profile of the northbound right-turn lane overflow into the adjacent through lane remains unchanged. | 1 | 2 | L | 1 | 2 | L |

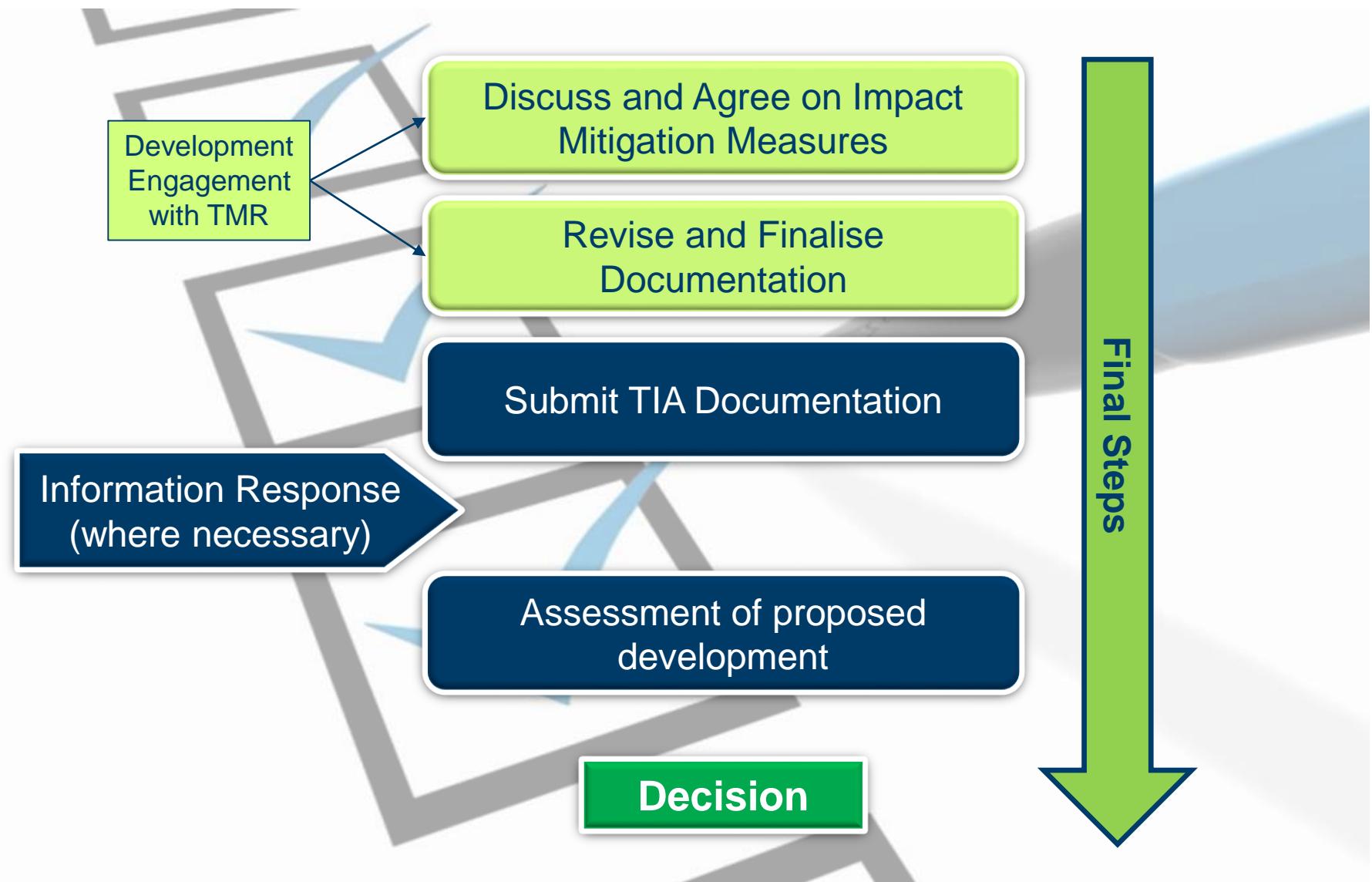
| TIA Item | Assessment |
|--|------------|
| Road Safety Impact Assessment and Mitigation | ✓ |

Step 5: Impact assessment and mitigation



| TIA Item | Assessment |
|--|------------|
| Access and Frontage Impact Assessment and Mitigation | ✓ |

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