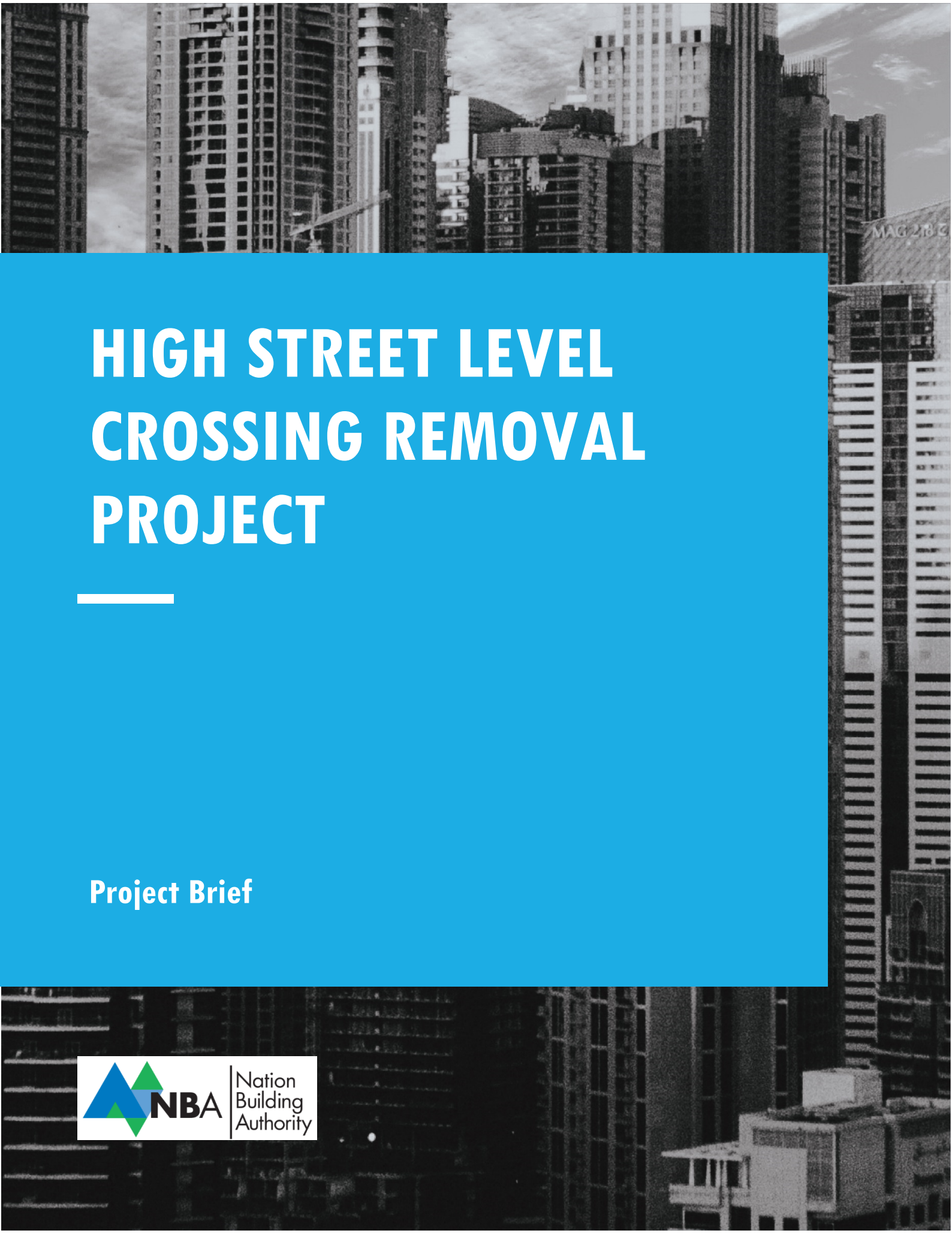

HIGH STREET LEVEL CROSSING REMOVAL PROJECT

Project Brief

NBA Nation Building Authority

Table of Contents

Part 1- PROBLEM 3
1.1 Background 3
1.2 Definition of the problem 3
1.3 Evidence of the problem 4
Part 2 BENEFITS 5
2.1 Benefits to be delivered 5
2.2 Importance of the benefits to Government 5
2.3 Evidence of benefit delivery 5
Part 3 PROJECT OPTIONS 7
3.1 Project Options Considered 7
Part 4 Project Delivery 9
4.1 Project Objectives 9
4.2 What You Need To Do 9
4.3 Team Selection 10
4.4 Weekly Meetings 10
APPENDIX A 11

PART 1- PROBLEM

1.1 Background

High Street, Ginley is located in the Ginley neighbourhood centre approximately 7.5 kilometres from central Melbourne.

As a SmartRoads preferred traffic route, High Street provides a strategic link between the Northern Highway and industrial and commercial centres in the east. High Street is a six-lane divided road with a speed limit of 60 kilometres per hour, carrying over 42,000 vehicles per day and 3,000 vehicles per hour during peak periods.

The Maley rail line runs through Ginley at surface level, bisecting the Ginley shopping centre at the level crossing on High Street. The rail line has three tracks that carry both suburban and freight services, with express and stopping services in peak periods. The Maley line carries 225 electrified passenger train services between Flinders Street and Ginley Station with 38 services in the AM peak (7am to 9am) and 34 services in the PM peak (4pm to 6pm), and an average of five diesel freight services each day (Refer Table 1-1).

High Street is a public transport bus route for the route 110 bus service and the route 231 bus service, with 21 bus services that pass the level crossing each day.

In April 2018, the State Government announced the removal of the level crossing at Ginley as a part of a Level Crossing Removal Program. The project has been committed to have commenced construction within the government's current term (By 2021).

1.2 Definition of the problem

Two main problems have been identified at the High Street Level Crossing.

PROBLEM 1: RELIABLILITY - PRIORITY GIVEN TO THE BUSY RAIL NETOWRK MEANS HIGH VOLUMES OF TRAFFIC ON HIGH STREET EXPERIENCE UNPREDICTABLE DELAYS AND CONGESTION.

High Street is classified in the VicRoads SmartRoads Road User Hierarchy Maps as a preferred traffic and bus priority route. However, its traffic flow is impeded by the level crossing on the Maley line at Ginley. The key problem being unpredictability and variability in traffic travel times and queuing during the peak periods caused by the level crossing. When the boom gates are open, traffic queues and clears completely, however when the boom gates are closed for a significant amount of time due to train operations and at times train delays, the boom gate closures can lead to extensive delays and queuing which can stretch back to the next intersection.

PROBLEM 2: PEDESTRIAN SAFETY - PEDESTRIAN MOVEMENTS AROUND THE LEVEL CROSSIN ARE A SIGNIFICANT SAFETY HAZARD EXPECIALLY FOR SCHOOL CHILDREN.

Ginley neighbourhood centre is classified by the VicRoads SmartRoads Road User Hierarchy Maps as a pedestrian priority area.

Pedestrians cross the rail line using at-grade crossings on both sides of High Street, which include actuated pedestrian gates that operate with the boom gates. Alternatively, pedestrians may use the underpass on the northeast side of High Street, which connects both sides of the rail line and to all platforms of Ginley Station. The ramps of the underpass are steep and therefore are not Disability Discrimination Act (DDA) compliant. Additionally, the underpass does not allow passive surveillance of pedestrians, increasing the risks, especially for late night and weekend services.

There is a primary and senior school nearby to the level crossing and a number of the students use the train to get to school. This involves crossing the level crossing at peak times, when traffic is at its worst. While there are actuated pedestrian gates, young children are prone to higher risk-taking behaviour which could lead to a serious incident in the future.

1.3 Evidence of the problem

PROBLEM 1: RELIABLILITY - PRIORITY GIVEN TO THE BUSY RAIL NETOWRK MEANS HIGH VOLUMES OF TRAFFIC ON HIGH STREET EXPERIENCE UNPREDICTABLE DELAYS AND CONGESTION.

Passenger rail services that travel through the High Street level crossing in peak periods on weekdays are shown in Table 1-1 below.

Table 1-1: MTM services that stop at or pass through Ginley Station, Monday to Friday

Services		AM Peak	PM Peak
To City	Stopping	12	9
	Express	9	0
	Total	21	9
From City	Stopping	11	12
	Express	0	8
	Total	11	20

The variability in boom gate closure times is highly dependent on whether trains run to schedule; late trains can overlap with the next running service, causing extended boom gate closure times. Most boom gate closures are under 3 minutes, though extended boom gate closures can occur once or twice in the peak period. Modelled and observed boom gate closure times for peak periods is shown in Table 1-2.

Table 1-2: High Street boom gate closures.

Boom Gate Closure Time	AM Peak 7am to 9am (minutes: seconds)	PM Peak 4pm to 6pm (minutes: seconds)
Average closure (observed)	2:36	3:00
Maximum closure (assuming trains run on schedule)	4:02	3:50
Maximum (observed)	6:28	5:49

The impact of variable boom gate closures on queuing and travel times in the AM peak was observed over three days in June 2018. The data collected shows that queue lengths are directly related to the duration of the boom gate closures, with extended closures leading to compounding queue lengths through the next cycle. The queues varied in length from an average of 100m to over 350m dependent on the length of time the boom gates are down, leading to significant variability in travel times.

Traffic modelling based on the scenario of 'do nothing' results in boom gates closed for over 50% of peak hour, resulting in unacceptable traffic delays and queuing.

PROBLEM 2: PEDESTRIAN SAFETY - PEDESTRIAN MOVEMENTS AROUND THE LEVEL CROSSIN ARE A SIGNIFICANT SAFETY HAZARD EXPECIALLY FOR SCHOOL CHILDREN.

Pedestrian movements around the level crossing are generally by people accessing shops and businesses on High Street, school children crossing High Street to access the bus stop and station and commuters transferring to and from buses.

A pedestrian survey was undertaken in April 2018. This survey indicated that typically 30-40% of pedestrians crossing High Street are children. It is known that many school children cross High Street on their journey to and from school; both to reach the nearby school and to transfer between trains and buses.

Assessment of the recorded Transport Safety Victoria data, indicated that five near-misses occurred with a train at the level crossing in the past ten years. Two of these near-misses involved a vehicle and three near misses involved a pedestrian.

Over the past five years, VicRoads CrashStats data indicated a total of 42 crashes at and/or near the level crossing. Of these, 12 incidents involved a vehicle and a pedestrian. Two crashes involved a vehicle and a pedestrian crossing High Street at the level crossing resulting, in minor injuries.

PART 2 BENEFITS

2.1 Benefits to be delivered

Removing the level crossing on High Street will provide two key benefits to the community, road and public transport network.

Improved Transport Network Efficiency 75% - Addressing the congestion and delays caused by the busy level crossing will improve the efficiency of the greater transport network by reducing travel times and queues, and in particular improving reliability of travel times for all transport. Improving the reliability of travel time has benefits, as motorists and commuters do not need to allow for extra travel time when planning journeys in the area.

Safer Travel 25% - This investment will deliver safer travel for public transport users, specifically pedestrians that switch transport modes. Depending on the options selected, the investment will either eliminate or substantially reduce the risk of school children and other pedestrians being exposed to moving traffic at this location.

2.2 Importance of the benefits to Government

The proposed project will address the previously mentioned problems to align with the following Government priorities:

Government Commitment – Planning for and commencement of the removal of the level crossing at High Street within the government's current term.

Transport Integration Act 2010 – The project objectives align with the Act to provide a better integrated transport solution.

VicRoads Strategic Directions 2016-2018 – The project aligns with the strategic priority to upgrade roads to tackle congestion, in particular to focus on congested metropolitan rail level crossings.

Department of Transport (DoT) Plan 2011 - The DoT Plan is developed in accordance with the transport system objectives of the Transport Integration Act 2010, which includes the priority strategies and activities of the Government's transport portfolio over the next three years. There are five priorities in the Plan that are expected to align strongly with the expected outcomes for this Project which are:

- Improving transport services
- Increasing safety on the transport system
- Increasing transport system capacity, efficiency and resilience
- Improving corporate governance and capability to better deliver transport outcomes
- Undertaking planning to address current transport deficiencies and provide for future transport demand.

2.3 Evidence of benefit delivery

During delivery, a project team will oversee the implementation of the investment, including the delivery of the expected benefits. Progress against the delivery of the expected benefits would be reported to the Executive Director – Policy & Programs. The Project Director would be responsible for monitoring the achievement of performance targets and to advise on actions to be taken to improve any area where the performance target is not achieved.

For each benefit, specific measures and targets are included in Table 2-1.

Table 2-1 Evidence of Benefit Delivery

Key Performance Indicator	Measure	Target
Improved Transport Network Efficiency		
Improved Travel Time Reliability	Variability in travel time between two nearest intersections	Reduction in variability in travel time by 50%
Reduction in delays caused by level crossing	Average travel time between two nearest intersections	Reduction in average travel time by 6%
Improved connectivity between bus & rail networks	Distance walked to safely connect between transport modes	Less than 50m between transport modes
Improved safety in the vicinity of the crossing		
Reduction in pedestrian exposure to conflict points	Number of conflict points for pedestrians in vicinity of crossing	50% reduction in conflict points
Reduction in crashes & near misses	Recorded crashes or near-misses at the level crossing	Zero accidents at the level crossing.

PART 3 PROJECT OPTIONS

3.1 Project Options Considered

A strategic options analysis was undertaken and the following project options have been selected to be examined in more details as shown in Table 3-1

Table 3-1: Details of Proposed Solutions

Strategic option	Project option
Strategic Option 0: Do Nothing	
No investment	**Project Option 0:** No investment
Strategic Option 1: Grade Separation	
Separates road and rail networks at the intersection.	**Project Option 1A:** Road Over Rail
	Project Option 1B: Road Under Rail
	Project Option 1C: Rail Over Road
	Project Option 1C: Rail Under Road
Strategic Option 2: Close High Street at Level Crossing	
Removes level crossing by closing the road, requiring possible alternative routes.	**Project Option 2:** High Street Closure

Site Plans are attached in Appendix A.

Project Option 0

This option relates to retention of the status quo. The existing road and rail network infrastructure is retained as is. Over future years population growth will likely increase demand for rail and road based transport leading to increased conflict, greater delays for all modes and increased safety risk.

The continued deterioration of the existing rail network including signaling and overhead wiring assets are likely to lead to reduced reliability into the future.

Project Option 1A

This option would retain the rail tracks at existing ground level. High Street at the railway corridor would be elevated above the rail line on a bridge type structure. This would require adjoining ramping structures, to take the existing roadway from ground level at the extremity of the works to an elevation of approx. 7m above natural ground level at the railway corridor.

Potential impacts include loss of access for properties and businesses on High Street and loss of visual amenity for adjoining residents.

Project Option 1B

This option is the opposite of Option 1A. Rail tracks would be retained at natural ground level in the completed state. Instead the roadway would be lowered along High Street into a trench. At the rail corridor the roadway would be approximately 5.5m lower than existing ground level.

This option is also likely to impact on access to local properties and commercial premises. Impacts to groundwater and in ground utilities are unknown at this stage. It is understood that there is a significant Ginley Water sewer asset running along High Street. Construction of a long trench poses a risk of undermining adjoining buildings and structures.

Project Option 1C

This option would elevate the railway from existing ground level. A new bridging structure would be constructed within the railway corridor. This would be much longer than the structure required under Option 1A as the maximum allowable grade on the railway is 2%. The road network would be retained as is on natural ground level.

Due to increased power draw from trains to traverse the ramping section of the new structure a traction power upgrade may be required. A power study has been commissioned and results will be available in the near future.

The construction of a significant civil structure within the rail corridor will require a substantial closure of the rail network, currently estimated at 60 days. This will require bussing of passengers along the rail network to a neighbouring station where train services can shuttle back and forth to the city from. This disruption will likely impact on customer satisfaction and increase congestion on the road network during the rail closure. Constructing the new infrastructure in a time limited manner (60 days) may increase occupational health and safety risks for construction staff.

Project Option 1D

This option would lower the railway from existing ground level to approximately 7m below surface level. Again, maximum allowable rail grade (2%) will govern the length of structure. The road networks would be retained as is.

Similar to Option 1C power upgrades are considered likely and will be determined by the power study.

The proposed construction staging methodology has identified the ability to construct a large portion of the works ‘offline’ – that is on land abutting the existing tracks. This will allow the rail network to continue to operate with minor rail closures (weekends, overnight etc.) and one larger 25 day closure (Occupation) for the major structure and commission works. This larger closure will cause disruption for rail passengers and create short term congestion impacts on the adjoining road network.

Project Option 2

This option would effectively truncate High Street on either side of the rail line. This would bring large benefits for rail users and pedestrians movements within the precinct as conflicts with road based transport and associated safety risks would effectively be eliminated. However, the upgrade to adjoining roads would be required to handle the increase in traffic that would normally use this route. This raises new issues such as impacts on adjoining properties due to increased traffic volumes, potential delays on adjoining routes unless an infrastructure upgrade releases new capacity and likely increases in road crashes.

PART 4 PROJECT DELIVERY

4.1 Project Objectives

This exercise will assist in your learning by providing you with an opportunity to apply you have learnt to a real design situation. This exercise will assist you to:

- Understand an apply Risk Management Process
- Evaluate and select a preferred Option (feasibility study)
- Develop an approach to solving real life engineering problems, and
- Develop and practice skills to work and communicate in a professional design environment.

4.2 What You Need To Do

The Nation Building Authority (NBA) has retained your companies services to assist with the Risk Management and Option Selection (Feasibility) component of the project. In response to the Problem outlined in Section 1, desired benefits in Section 2 and Options (Section 3) you need to form a project Design Team (six to ten students).

Working in your Design Team your initial task is to conduct Risk Assessment Workshop to brainstorm/ identify and capture project risks. After the workshop you should analysis and evaluate the risks. The output of this work should be presented in the initial Risk Register which will be submitted for review.

Subsequent to the submission of the Risk Register you will work on the Option Selection (Feasibility) component of the project. More information will be provided on this phase of the project at a future date. This update will include further technical information on the proposed options and a framework to evaluate the options. Applying risk-based decision making the Risk Register will be reviewed and updated. The outputs of this phase will be a Design Report documenting the option selection process including risk management and identifying the preferred option. You will also present to the Project Owner outlining your investigation including risk-based decision making process and selection of the preferred option.

Table 3-2: Summary of Major Tasks

Week	Date	Project Stage	Summary of Major Tasks
5	14/08/2018	1	Risk Assessment
10	25/09/2018	2	Short Design Report including selected design outcome
11	02/10/2018	3	Student Presentations

4.3 Team Selection

You will work in a Design Team of six to ten students. The composition of the team is responsibility of the students.

A team member should lead the team for all or part of the project. Their contribution to lead the team should be reflected input to deliverables. The team leader is responsible for (at least):

- Good communication within the team and outside the team,
- Ensuring team members keep staff up to date on progress,
- Convening and chairing team meetings,
- Planning team activities,
- Ensuring team members carry out allotted tasks on time and to specified quality,
- Team administration

4.4 Weekly Meetings

You should be familiar with working in groups and what constitutes successful group-work. You are encouraged to meet weekly and keep a written record of your meeting to:

- Facilitate steady progress of the exercise,
- Identifying and prioritise key actions including owners,
- Aid in your professional development,
- Assist in resolution of disputes between team members should they arise.

APPENDIX A

Certified By: (BLOCK LETTERS) (SIGNATURE) (DATE)

NORTHERN HIGHWAY

MOSY AVENUE

GIDY LANE

TREE STREET

SHORT LANE

GINLEY STATION

RAILWAY AVENUE

SHOPPING ALLEY

BAR STREET

INDUSTRIAL STREET

HIGH STREET

HIGH STREET

MOSY AVENUE

CRISP STREET

BANK STREET

ST JAMES'S SCHOOL

RAILWAY AVENUE

HOUSE STREET

STRAIGHT STREET

TURN LANE

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Rev.	Approv.

Consultant

Franchisee / Lessee

NBA Nation Building Authority

RAILWAY TRACK & CIVIL
HIGH STREET LEVEL CROSSING
LEVEL CROSSING REMOVAL
EXISTING LAYOUT PLAN

Up Location	Down Location	Datum
East. North. ID#	East. North. ID#	

VicTrack ACCESS

File Name

Sheet No. 01 of 01

In Serv.

Scale 1:1000 | Sheet Size A1

Drawn By	Designed By
Checked By	Ind. Review
Approved	Approval Date

Drawing Number DWG_0001 | Revision A

12/07/2018 10:16:32 AM

C:\Users\samantha.dungey\Documents\Mark\RMIT Collaboration\CADD\SK1001.dgn