



Golder Associates

CENTREX METALS – PORT SPENCER EYRE PENINSULA

TRAFFIC IMPACT ASSESSMENT

September 2011

11-0036

Traffic • Parking • Transport

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1.0 INTRODUCTION

Centrex Metals Limited (Centrex) proposes to construct a deep water shipping port on Eyre Peninsula, capable of accommodating Cape class vessels with 180,000 to 240,000 tonne capacity to facilitate the export of bulk minerals and grain.

Investment in the port project is estimated to be in the order of \$180 million.

This project has been gazetted as a Major Project by the State Government in January 2011, with guidelines for the preparation of a public environmental report issued in April 2011 by the Department of Planning and Local Government (DPLG). Note that the project was previously referred to as Sheep Hill Port, as can be seen in earlier documents and drawings referenced in this report.

Centrex has extensive tenement holdings over iron ore resources (particularly hematite and magnetite sources) on Eyre Peninsula, extending over an area of 2,000 km².

Port Spencer is located approximately 70 km north-east of Port Lincoln, within the District Council of Tumby Bay (refer Figure 1).

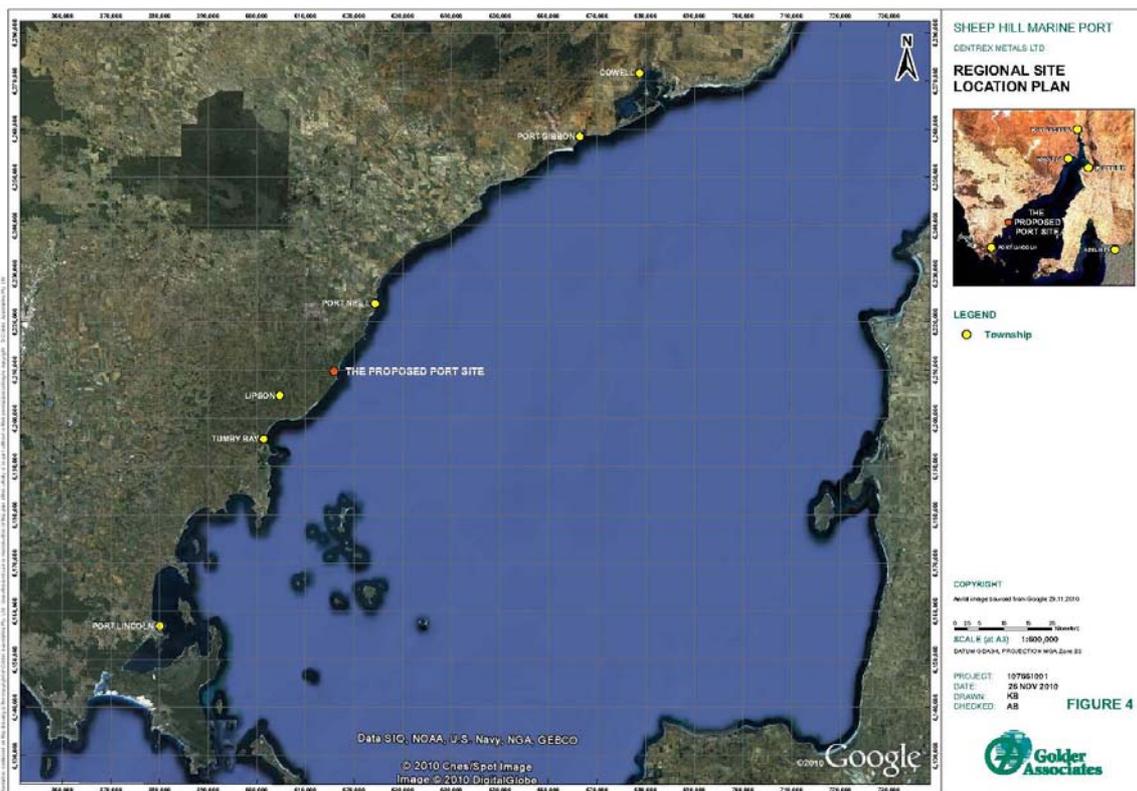


Figure 1: Locality plan



The project comprises the construction and operation of the port facility and the upgrade of Swaffers Road and Lipson Cove Road. The project is proposed to be undertaken in four stages, with the current development application focussing on Stage 1 only which involves the construction of the port, jetty and storage facilities for hematite and grain export, as well as upgrading Swaffers Road to provide heavy vehicle access and upgrading Lipson Cove Road to improve access for passenger vehicles.

In terms of the transport task, Stage 1 is expected to export approximately two million tonnes of hematite and one million tonnes of grain per annum.

The hematite will be initially sourced from Centrex's Wilgerup mine site, located to the north-west of the proposed port, being one of a number of Centrex iron ore projects to be developed on the Eyre Peninsula in coming years. At this time, two possible routes are being considered to transport this material from the mine site to the port.

Future stages of the project will involve the export of magnetite through the port, with the provision of additional storage facilities as the volume of this resource increases over time. These stages will be submitted for development approval individually over time, as the proponent may not be Centrex in any of these proposals, given there are a number of other resource companies having tenements within the Eyre Peninsula region, with some of these companies potentially also using the port facility to export their material.

The proponent of any future stages of development at the port will be responsible for seeking the appropriate development approvals.

Given the increased resource demand, particularly from China, there is increasing pressure for industry to plan for efficient transport options.

Port Spencer offers an opportunity to develop an alternative port and shipping option to Port Lincoln, and a more local option to Whyalla, reducing transport distances and improving time taken to transport product to market.

This report examines the traffic implications associated with Stage 1 of the Port Spencer development and provides recommended improvements to the road junctions connecting to this facility.

2.0 PROPOSED ACCESS ARRANGEMENTS

The Port Spencer facility will cover some 48 hectares of land and is positioned between Swaffers Road and Lipson Cove Road on the east coast of the Eyre Peninsula (refer Figure 2).



Figure 2: Port facility showing adjacent road network

Heavy vehicles will be required to access the port facility via Swaffers Road to the north of the site. This requirement will be managed through contractual arrangements with transport companies, etc. and is proposed to be reinforced by appropriate signs located on the Lincoln Highway approaches to the Swaffers Road access.

In Stage 1 of the development, some 70 heavy vehicles are expected to travel to and from the site each working day (i.e. 140 vehicle movements in total) to deliver the hematite to storage facilities at the port.

A further 40 vehicles per day could be expected to transport grain to storage facilities either direct from the farm gate during the grain harvesting season (generally over a six to eight week period around December) or from other remote storage facilities spread across the Eyre Peninsula throughout the year. The vehicle types are expected to range from truck and trailer combinations through to B-Doubles and Road Trains, to fill an assumed 60,000 tonne storage facility that is intended to be provided at the port.

Approximately 30 staff are expected to be on site once Stage 1 is operational. Access to the site for passenger vehicles will be via Lipson Cove Road.

In terms of transport of hematite from the mine site to the port, Centrex are currently considering two route options.

One option (route 1) brings the transport onto the Lincoln Highway to the north of Port Neill and then south to Swaffers Road, linking through to the port (refer Figure 3).

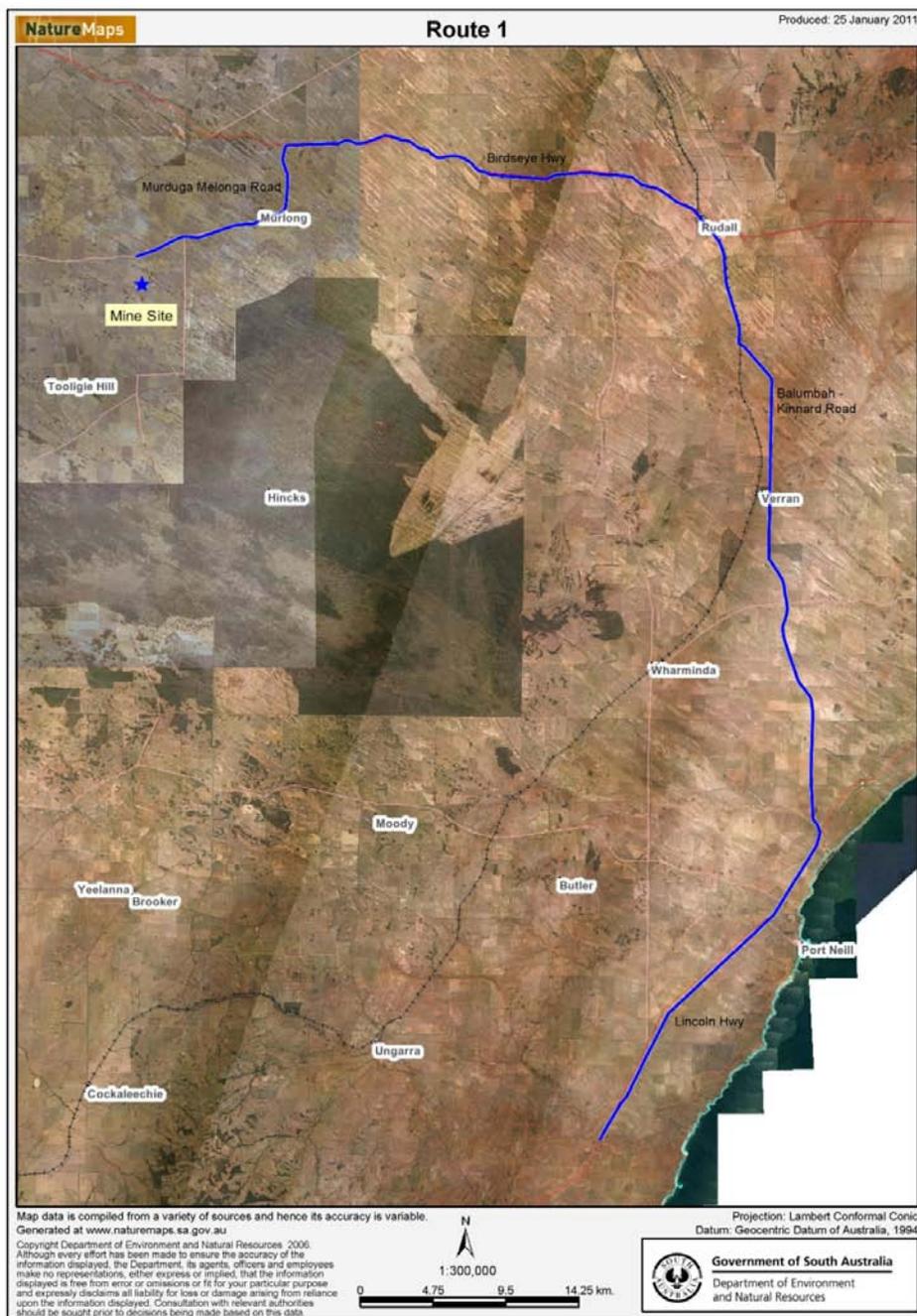


Figure 3: Hematite transport route Option 1

The other option (route 2) being considered is a route which uses the Tod Highway, west of the mine site near Murdinga, travelling south to Cummins, then travelling east via Bratten Way to the Lincoln Highway at Tumby Bay, before proceeding north along the Lincoln Highway to access the site (refer Figure 4).

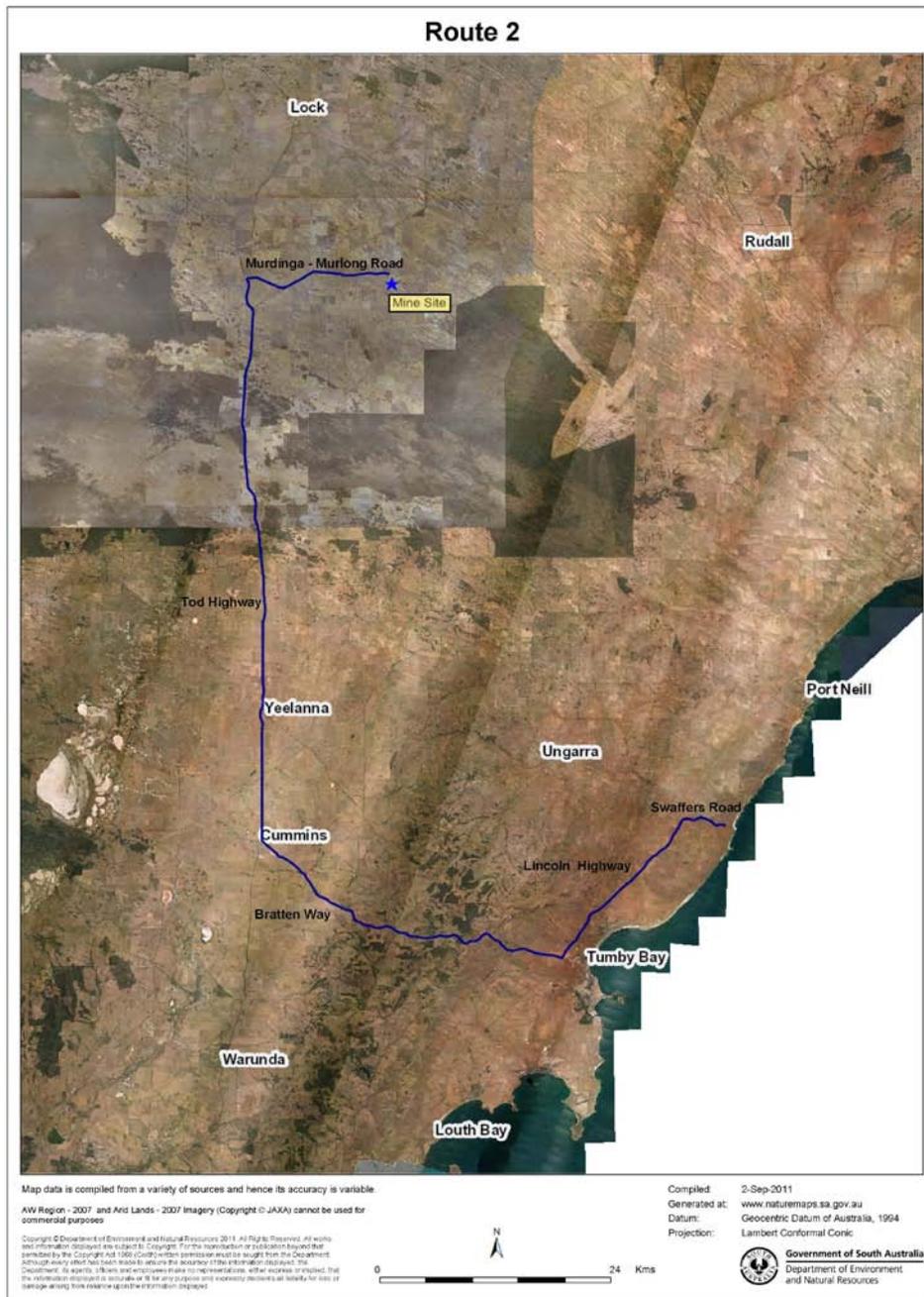


Figure 4: Hematite transport route Option 2

These route options are not considered in any further detail in this report, but serve to provide an understanding of the possible distribution of heavy vehicle movements associated with the transport of hematite between the mine site and the port and potential treatment options at the junctions with the Lincoln Highway.

3.0 EXISTING ROAD CONDITIONS

The existing road network adjacent to the Port Spencer site is described below.

3.1 LINCOLN HIGHWAY

Lincoln Highway is an arterial road under the care and control of the Department for Transport, Energy and Infrastructure (DTEI). The highway generally follows the east coast of Eyre Peninsula extending from the heart of Port Lincoln and connecting to the Eyre Highway north of Whyalla.

In the vicinity of Lipson Cove Road and Swaffers Road, the road has a sealed width of approximately 10 m, with 3.6 m wide lanes and sealed shoulders. The road traverses areas of cut and fill along its length. Around the Swaffers Road junction the road is in an area of significant fill, with a culvert in place to maintain a natural watercourse which crosses beneath the highway. A 110 km/h speed limit applies to this section of road.

According to the traffic data provided by DTEI, traffic volumes along the Lincoln Highway are in the order of 750 vehicles per day (vpd), with approximately 17% commercial vehicle content (October 2006 data).

MFY engaged Austraffic to conduct classification counts on both the Lincoln Highway (between Swaffers Road and Lipson Cove Road) and on Lipson Cove Road on 6, 7 and 8 April 2011, to obtain recent traffic information (refer Appendix A).

The results of these surveys indicated that there had been some growth on the Lincoln Highway, with traffic volumes of approximately 1,100 vpd being recorded with 22.5% commercial vehicle content.

The road is gazetted for use by Road Trains and B-Double vehicles.

3.2 LIPSON COVE ROAD

Lipson Cove Road is an unsealed road under the care and control of the District Council of Tumby Bay. The road is constructed within a 20 m wide corridor and extends from a junction with the Lincoln Highway through to Lipson Cove on the coastline, a distance of approximately 7.4 km. Given the unsealed nature of the road, the default rural speed limit of 100 km/h applies to this road.

The formed road width is approximately 7 m to 8 m wide, with a number of horizontal curves along the alignment and provides access to a small number of rural properties.

From the traffic counts undertaken on Lipson Cove Road, an average of 52 vpd was recorded, with a commercial vehicle content of 10%.

The road rises toward the Cove Road intersection, where Lipson Cove Road has priority through the give-way controlled intersection. From the intersection, the road falls toward the coast until rising again at the coastline, before turning south toward Lipson Cove and the associated camping ground.

3.3 SWAFFERS ROAD

Swaffers Road is an unsealed road under the care and control of the District Council of Tumby Bay. The road is constructed within a 20 m wide corridor and extends from a junction with the Lincoln Highway through to an intersection with Coast Road, a distance of approximately 2.5 km. Given the unsealed nature of the road, the default rural speed limit of 100 km/h applies to this road.

The formed road width is approximately 7 m to 8 m wide, with a number of horizontal curves along the alignment, with access to at least two rural properties provided on the northern side of the road.

Drivers using Coast Road have priority over Swaffers Road at the intersection, with Swaffers Road under give-way control. On the eastbound approach to the intersection, Swaffers Road rises to the intersection, with an “advance intersection warning” sign and the give-way sign clearly visible on the approach.

The existing sight distance on the northbound approach is not sufficient to meet the Safe Intersection Sight Distance (SISD) requirements as set out in the Austroads *“Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections”*, assuming the 85th percentile approach speed to be 80 km/h and a 6% decline to the intersection. On this basis, the SISD for a passenger vehicle on an unsealed surface would need to be in the order of 230 m. The crest in Coast Road is approximately 210 m from the intersection.

On the southbound approach, the SISD is achieved. Similarly on the minor road legs (i.e. Swaffers Road approaches), the Approach Sight Distance (ASD) requirements are met.

Existing vegetation on the verges impacts slightly on the available sight distance.

Swaffers Road extends further east towards the coast where the formed road width narrows and the road generally provides access to one or two farming properties. The road is signed as a “no through road” at the Coast Road intersection and ends at a gated property access.

3.4 COVE ROAD

Cove Road is an unsealed road under the care and control of the District Council of Tumby Bay. The road is constructed within a 20 m wide corridor and parallels the Lincoln Highway to the east, approximately midway between the coast and the highway, for a distance of approximately 22 km, forming junctions at either end with the Lincoln Highway. Given the unsealed nature of the road, the default rural speed limit of 100 km/h applies to this road.

While the road has not been examined in detail, the intersections with both Swaffers Road and Lipson Cove Road have been visually assessed.

3.5 EXISTING RESTRICTED ACCESS VEHICLE NETWORK

The current approved Restricted Access Vehicle (RAV) networks for Road Train and B-Double vehicles are shown in Appendix B.

As can be seen from these maps, a significant amount of the road network across the Eyre Peninsula has been gazetted for use by these vehicle classes, including the Lincoln Highway.

4.0 TRAFFIC ASSESSMENT

4.1 ASSUMPTIONS

Given the early planning phase of this project, the land based transport task options are yet to be fully investigated and preferred options selected by Centrex.

This traffic assessment is therefore based on the following assumptions, some of which have been based on initial information provided by Centrex and other information being based on professional judgement.

- Vehicle type – in the first stage of this project, all material to be exported via the port will be delivered via heavy vehicle combinations. Given a significant proportion of the existing road network is currently gazetted for use by Road Trains and that a significant number of these vehicles already operate along the Eyre Peninsula, this is considered to be the appropriate vehicle to consider in terms of geometric requirements and vehicle trip numbers as part of this assessment (for the mineral component);
- Traffic movement associated with grain delivery – it is anticipated that approximately one million tonnes of grain will be exported via the port every year. Based on this, and assuming 80% of the freight task will be undertaken using Road trains (carrying 79 tonnes each) with the remainder based on vehicle combinations carrying 45 tonnes (e.g. semi-trailer or truck and trailer combinations), it could be expected that approximately 29,000 movements per annum (in and out of the site) would be required to export this quantity of grain;
- A storage facility in the order of 60,000 tonnes is anticipated to be provided for grain storage at the port. The balance of the grain to be exported through the port is assumed to be stored at other locations across the Eyre Peninsula and transferred to the port facility as required. The intended operating regime being considered at this time is to fill or partially fill a ship by completely depleting the port based storage facility and then refill the storage facility in time for the arrival of the next ship. This infers that there will be a constant flow of grain deliveries to the port, rather than any peaks associated with keeping up supply to completely fill a Cape class vessel within a short period of time; and
- On this basis there could be a peak of 40 deliveries per day (i.e. 80 vehicle movements in total), assuming the one million tonnes is delivered to site over a 12 month period, with carting occurring seven days per week.

4.2 TRAFFIC GENERATION

As discussed in Section 3, traffic volume data for the Lincoln Highway and Lipson Cove Road was collected in April 2011.

The recorded traffic volumes for both roads are well within the capacity of two-lane, two-way rural roads, particularly Lincoln Highway, which can accommodate in the order of 1,800 vpd (Austroads *“Guide to Traffic Management – Part 3: Traffic Studies”*).

Given the low volumes on Lipson Cove Road, it is considered conservative to assume the same volumes on Swaffers Road in terms of the existing traffic loading.

The traffic generation rates for the proposed port development have been based on advice provided by Centrex in relation to the anticipated construction and operation of the port and are discussed below. These rates have been reviewed and are considered reasonable when taking into account the projected freight task and likely vehicle type to be used.

In terms of the mineral side of the operation, it is expected that a total of 140 truck movements to and from the site will occur essentially every day over the course of a year to achieve a target of two million tonnes of ore export.

In terms of grain delivery, it is anticipated that the majority of the deliveries will originate in the north or north-west of the Eyre Peninsula. Most of the grain will be delivered from other off-site storage locations such as Tumby Bay to the south. As discussed in Section 4.1, the peak traffic generation for grain delivery is expected to be in the order of 80 truck movements per day.

The management of the storage and arrival of ships to be loaded will impact on the traffic generation associated with heavy vehicle movements to deliver to the storage facilities. The time between the arrival of ships will determine how quickly the storage facility will need to be replenished and therefore the intensity of traffic movements associated with the number of deliveries. At this stage of the planning process, it has been assumed that a constant rate of delivery to the site will address the demand to service grain carrying vessels expected to call at the port.

The above number of heavy vehicle movements for both ore and grain are considered conservative, and take account of the capacity of the storage facility to manage the unloading of heavy vehicles.

In regard to passenger vehicles, there is expected to be up to 30 people working on site, and, therefore, in a “worst case” scenario there would be 60 to 75 vehicle movements to and from the site each day, based on each person travelling to the site as a single occupant in a vehicle, and allowing for some additional trips during the day.

4.3 CONSTRUCTION TRAFFIC

Construction of the port and wharf facilities is anticipated to be carried out over a 24 month period.

The construction workforce is anticipated to range from 50 to 250 people on site at any one time, with the intent that the larger size workforce is accommodated in local towns and transported to site in buses, rather than single occupant vehicles, although it would be expected that there would still be some component of this type of travel.

Construction traffic is therefore expected to consist of up to 20 trucks per day, three buses and ten light vehicles, undertaking one trip in and one trip out each per day.

Even in a “worst case” scenario where all the workforce chose to drive in single occupant vehicles, there would be a maximum of 250 vehicle movements per hour.

This would be well within the capacity of a two-lane, two-way road, considering the existing volumes along this section of either the Lincoln Highway or Lipson Cove Road, however is considered unlikely to eventuate given the majority of the workforce are intended to be transported to and from the site by bus.

4.4 TRAFFIC IMPACT

The layout of the port and storage facilities will be based on all heavy vehicle movements accessing the facility via Swaffers Road.

This will place pressure on the Lincoln Highway/Swaffers Road junction which currently would have few turning movements, particularly by heavy vehicles.

The two route options currently being considered for the delivery of hematite to the port will result in either vehicles approaching from the north (route 1) or south (route 2).

The anticipated movement of grain product to the port will be from the north or north-west of the Eyre Peninsula for Stage 1, with an estimated 20% arriving from the south, particularly from the Tumby Bay storage facility, or from the west with access via Bratten Way to the Lincoln Highway.

Given the above, the anticipated peak hour movements at the Swaffers Road junction are likely to be in the order of that depicted in Figure 5 and 6.

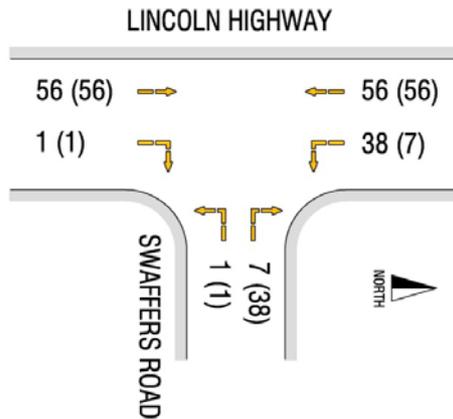


Figure 5: Expected turning movements at Swaffers Road – ore from the north

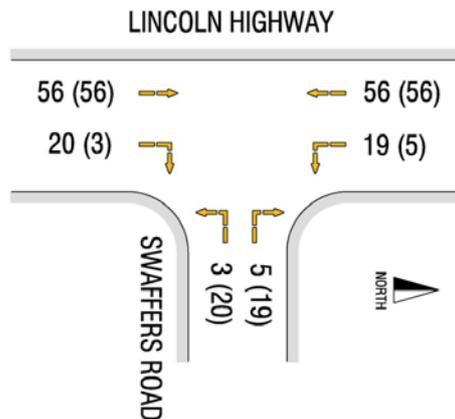


Figure 6: Expected turning movements at Swaffers Road – ore from the south

For the Lipson Cove Road junction, the “worst case” scenario would occur during the construction phase if all workers drove to the site in individual vehicles. The anticipated peak hour movements in this scenario could therefore be in the order of that depicted in Figure 7.

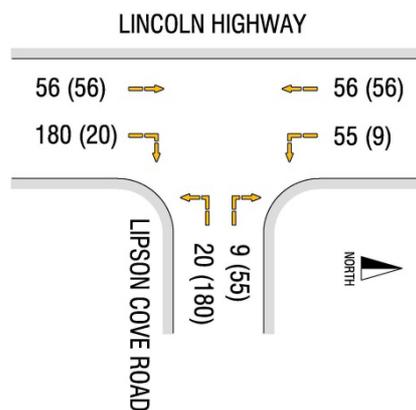


Figure 7: Expected turning movements at Lipson Cove Road



Both junctions have been assessed using SIDRA traffic analysis software. The modelling was based on the existing junction arrangement, whereby no turning lanes were provided. This is considered a “worst case” scenario in terms of efficiency of the junction, in that turning vehicles will interrupt the through vehicles as they slow to turn or give-way to oncoming traffic.

The results of this modelling indicate that both junctions will operate well within capacity, with very minor delays, in the order of ten seconds on the Lipson Cove Road leg and 13 seconds on the Swaffers Road leg, irrespective of the direction from which the hematite is delivered to the port (refer Appendix C).

Given these results, no junction upgrades are required from a traffic efficiency perspective. However, from a road safety perspective, it is considered appropriate that improvements are made to the two junctions and the suggested treatment of the junctions is discussed further in Section 5.

5.0 PROPOSED ROAD UPGRADES

As part of its proposal, Centrex intends to upgrade both Swaffers Road and Lipson Cove Road between Lincoln Highway and the port facility to cater for the increased traffic volumes and vehicle types expected to use these roads. Such upgrades are considered appropriate, particularly given the heavy vehicles anticipated on Swaffers Road.

5.1 SWAFFERS ROAD

In terms of Swaffers Road, the upgrade includes the widening and sealing of the road carriageway to cater for the expected heavy vehicles to be used to transport minerals and grain to the port.

The upgrade of the road will need to consider design factors such as the desirable speed limit of the upgraded road, desired operating speed of the heavy vehicles which will then influence the radius of horizontal and vertical curves along the road. Given the lack of abutting development that is currently present, it would be reasonable to expect a 100 km/h speed limit to be applied to an upgraded Swaffers Road.

In terms of the required junction upgrade with Lincoln Highway, the treatment also needs to consider the existing junction of Berryman's Road with the Lincoln Highway, approximately 40 m south of the Swaffers Road junction.

Berryman's Road is an unsealed road under the care and control of the District Council of Tumby Bay. Berryman's Road connects through to Butler Centre Road which provides access to the northern interior of the Eyre Peninsula.

While the projected traffic volumes associated with Stage 1 of the Port Spencer development are relatively low, as are the through volumes along Lincoln Highway, there is a concern from a safety perspective in relation to having heavy vehicles waiting in the through lane to turn right into Swaffers Road, or equally right turning out of Swaffers Road to travel north.

While it could be argued that the warrant for a right turn facility on Lincoln Highway, as outlined in Austroads *"Guide to Road Design Part 4A"* is met to justify the provision of only the basic junction treatment (i.e. localised widening on Lincoln Highway to enable a vehicle to pass a right turning vehicle), the provision of a channelised right turn lane is deemed more appropriate given the types of vehicles that will use the junction as the designated heavy vehicle access to the port facility. The design will also need to consider providing access requirements for Berryman's Road.

Currently Swaffers Road rises on grade to the junction with the Lincoln Highway. It is considered important that a level area, capable of storing the largest vehicle expected to use the port, is provided at the intersection to enable the vehicle to wait for an appropriate gap in the traffic stream and be able to accelerate at a maximum rate, rather than having to also contend with moving off from an uphill grade. This will require significant earthworks to be undertaken on the Swaffers Road approach to achieve this. There may well be implications for existing services such as overhead power and telecommunications associated with this work which would need to be considered during the detailed design of the intersection.

The at-grade junction solution has been designed to generally be in accordance with Austroads *“Guide to Road Design Part 4A: Unsignalised and Signalised Intersections”* and some initial discussions have been held with representatives from DTEI. Further discussion will need to occur with DTEI through the detailed design phase to reach agreement on the scope of the improvement, particularly as it relates to providing acceleration lanes for heavy vehicles.

Figure 8 provides a concept design for this junction upgrade.



Figure 8: Lincoln Highway/Swaffers Road/Berryman's Road concept

At the intersection of the Cove Road and Swaffers Road, it is considered warranted to change the priority control, such that Swaffers Road through movements have priority, given they will be the highest traffic volume. Appropriate traffic control signs which could include advance intersection warning signs and advance give-way ahead signs, with supplementary distance plates would need to be installed on the Coast Road approaches.

Such a treatment would give drivers approaching the intersection sufficient advance notice of their approach to the intersection to prepare to stop their vehicle. The change of priority would also provide for more efficient movement of heavy vehicles to and from the port, as they would not be required to stop and give-way to other vehicles at the intersection. The change in priority will require Council endorsement.

To improve the sight distance at the intersection, some simple treatments, such as trimming vegetation from road verges and ensuring appropriate intersection warning

signs are in place will address the issues on most legs. This will need to be confirmed with a detailed engineering survey at the detail design stage.

It would also be desirable to seal Coast Road for at least 130 m on the southern approach and 180 m on the northern approach to the intersection which will provide safety and maintenance benefits, particularly within the intersection, as the likelihood of loose gravel being deposited within the intersection and creating a safety hazard will be significantly reduced.

A sealed surface on the Coast Road approaches will also provide a safer approach conditions, should a vehicle be required to brake heavily due to potential vehicle conflict on the approach.

For these reasons the sealing of the Coast Road approaches is highly recommended.

5.2 LIPSON COVE ROAD

Lipson Cove Road is proposed to be sealed from the junction with Lincoln Highway through to the access to the port to cater for passenger vehicles, including buses that will be accessing the site during the construction phase of the project.

At the junction, similar to the Swaffers Road junction, because of the relatively small traffic volumes expected to be encountered at this location, the Austroads Guide indicates that only minor road widening to provide a BAR treatment is warranted.

However, it is considered reasonable for Centrex to implement a channelised junction treatment as an OHS&W consideration for its employees, as well as providing a benefit for tourists and others accessing the Lipson Cove area.

Figure 9 provides a concept plan indicating the required extent of works for such a junction upgrade.



Figure 9: Lipson Cove Road proposed junction treatment

At the Coast Road intersection, Lipson Cove Road is the priority movement. Apart from some minor vegetation trimming or removal to maintain sight lines, no other works are considered necessary. Similarly to the Swaffers Road/Coast Road intersection, it is considered appropriate to seal both approaches of Coast Road for a distance of 150 m each for safety and maintenance reasons.

In relation to the proposed port access road location, there is insufficient sight distance available at the proposed location, due to a crest in Coast Road to the west of the proposed access.

Two alternative locations which will rectify this issue are to move the access point west to the top of the crest which will achieve appropriate sight distance in each direction. This is the recommended option and will need to be developed further through the detailed design phase of the project.

An alternative location is to locate the access on the bend as the Lipson Cove Road turns south toward the camping grounds at the Cove. Due to the curvilinear approach of the road from the camping area, sight distance in this direction will be restricted, as will the actual vehicle approach speeds. Given this limitation, this location is not recommended.

6.0 SUMMARY

This report has reviewed the potential traffic generation and access arrangements associated with the first stage of the proposed facility at Port Spencer.

The port will facilitate the export of both ore and grain products, and as such the type of vehicle requiring access to the port will vary. For the purposes of this report, Road Trains and B-Double vehicles have been assumed as the primary vehicle type.

From the analysis of the traffic generated by the port development, and considering the existing traffic volumes along Lincoln Highway, the predicted traffic volumes will be able to be catered for by the existing road network.

Notwithstanding this, it is recommended that both the Lipson Cove Road and Swaffers Road junctions with the Lincoln Highway be upgraded to provide safer access arrangements, including the provision of protected right-turn lanes on Lincoln Highway. The proponent also proposes to seal both these local roads through to the port facility.

The proposed upgrades to the arterial road have been discussed with officers from the Department for Transport, Energy and Infrastructure at a concept level, but will require further detailed negotiations to agree on the junction treatments should the project proceed.



APPENDIX A

TRAFFIC COUNT DATA – APRIL 2011

SA Traffic Services

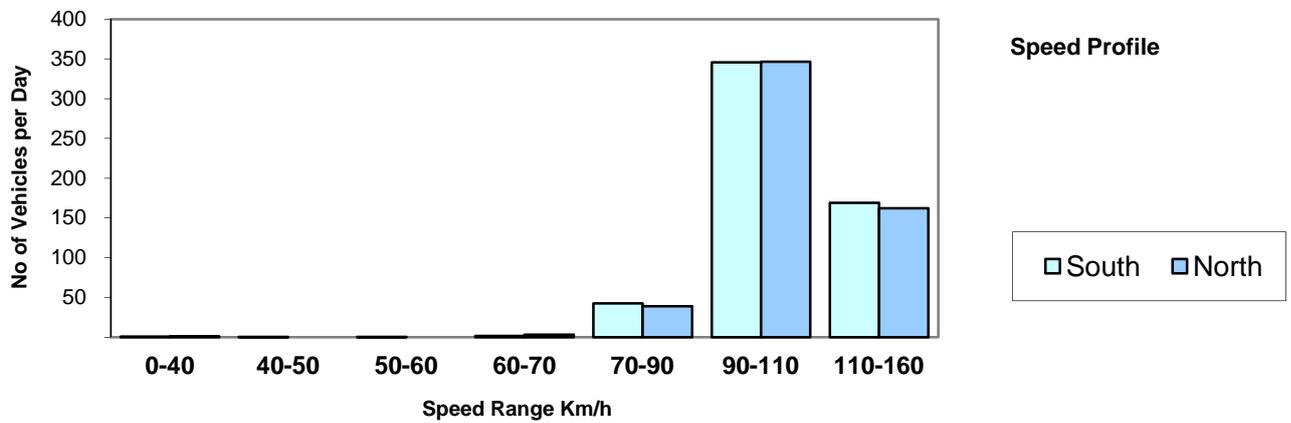
Traffic Survey

Lincoln Hwy 1km S of Swaffer Rd

Wed 6-Apr-11 To Fri 8-Apr-11

50

2-Way	0-40	40-50	50-60	60-70	70-90	90-110	110-160	Total	Mean	85%	Trucks
Wed 06 Apr 11	1			6	61	666	322	1056	104.4	113.6	245
Thu 07 Apr 11	2	1		7	100	679	313	1102	103.2	113.2	258
Fri 08 Apr 11	2		1	2	84	731	359	1179	104.3	113.6	249
Averages	2			5	82	692	331	1112	104.0	113.5	251
	0.2%			0.4%	7.4%	62.2%	29.8%	1112	=Weekday Ave		22.5%



South	0-40	40-50	50-60	60-70	70-90	90-110	110-160	Total	Mean	85%	Trucks
Wed 06 Apr 11	1			2	41	346	149	539	103.9	113.4	115
Thu 07 Apr 11	1	1		3	51	327	157	540	103.5	113.4	133
Fri 08 Apr 11			1		36	364	201	602	105.2	114.5	128
Averages	1			2	43	346	169	560	104.2	113.8	125
	0.1%	0.1%	0.1%	0.3%	7.6%	61.7%	30.2%	560	=Weekday Ave		22.4%

North	0-40	40-50	50-60	60-70	70-90	90-110	110-160	Total	Mean	85%	Trucks
Wed 06 Apr 11				4	20	320	173	517	104.9	113.8	130
Thu 07 Apr 11	1			4	49	352	156	562	103.0	113.0	125
Fri 08 Apr 11	2			2	48	367	158	577	103.4	112.7	121
Averages	1			3	39	346	162	552	103.8	113.2	125
	0.2%			0.6%	7.1%	62.7%	29.4%	552	=Weekday Ave		22.7%

SA Traffic Services

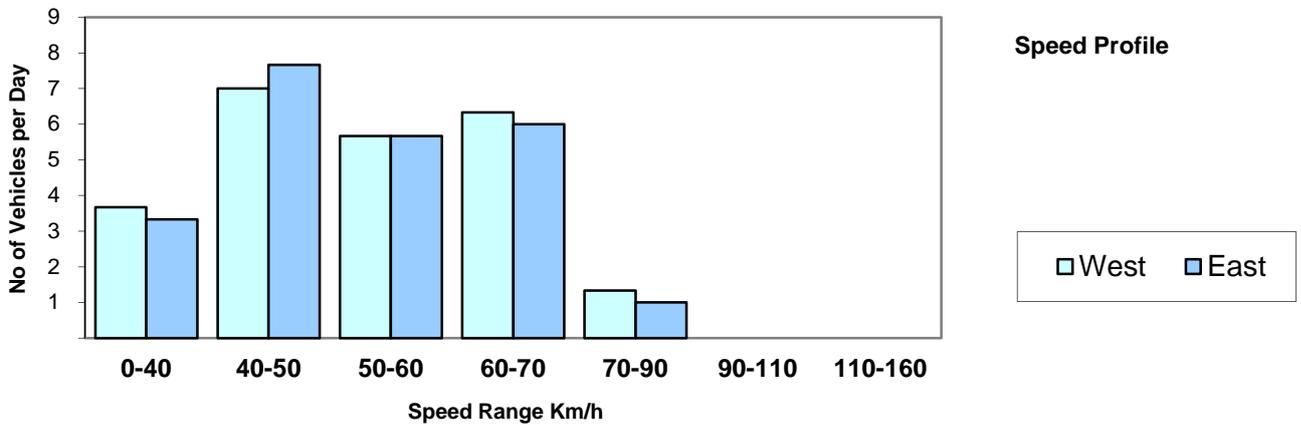
Traffic Survey

Lipson Cove Rd 200m East of Lincoln Hwy

Wed 6-Apr-11 To Fri 8-Apr-11

50

2-Way	0-40	40-50	50-60	60-70	70-90	90-110	110-160	Total	Mean	85%	Trucks
Wed 06 Apr 11	8	14	13	7	2			44	50.4	59.9	5
Thu 07 Apr 11	4	7	11	19	4			45	57.3	67.4	5
Fri 08 Apr 11	9	23	10	11	1			54	48.2	64.3	5
Averages	7	15	11	12	2			48	52.0	63.8	5
	14.6%	31.3%	22.9%	25.0%	4.2%			48	=Weekday Ave		10.4%



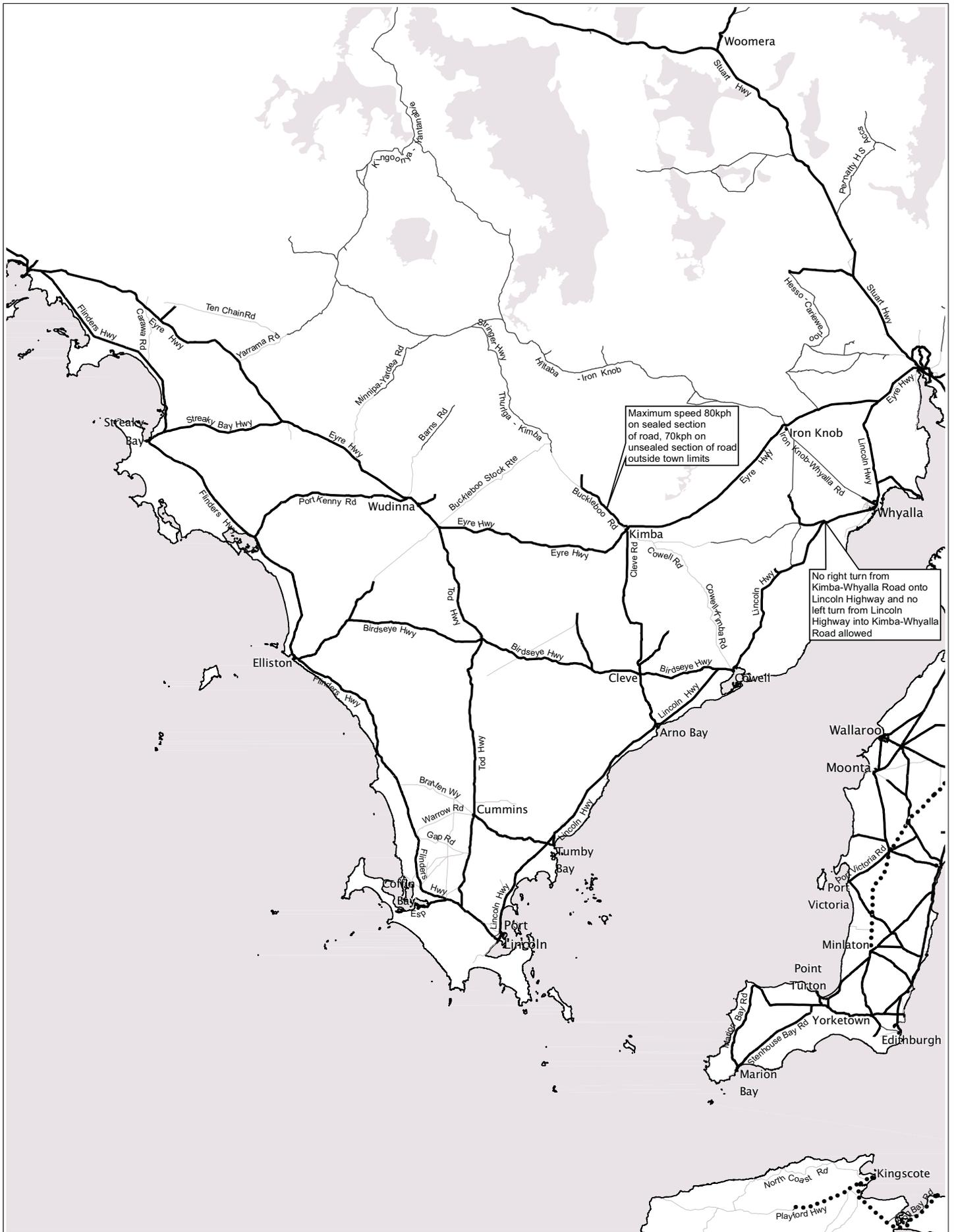
West	0-40	40-50	50-60	60-70	70-90	90-110	110-160	Total	Mean	85%	Trucks
Wed 06 Apr 11	2	5	7	4	1			19	53.9	61.9	2
Thu 07 Apr 11	3	2	6	11	2			24	57.7	68.4	4
Fri 08 Apr 11	6	14	4	4	1			29	47.1	67.0	3
Averages	4	7	6	6	1			24	52.9	65.8	3
	15.3%	29.2%	23.6%	26.4%	5.6%			24	=Weekday Ave		12.5%

East	0-40	40-50	50-60	60-70	70-90	90-110	110-160	Total	Mean	85%	Trucks
Wed 06 Apr 11	6	9	6	3	1			25	47.7	58.3	3
Thu 07 Apr 11	1	5	5	8	2			21	56.8	66.2	1
Fri 08 Apr 11	3	9	6	7				25	49.5	61.2	2
Averages	3	8	6	6	1			24	51.3	61.9	2
	14.1%	32.4%	23.9%	25.4%	4.2%			24	=Weekday Ave		8.5%



APPENDIX B

RESTRICTED ACCESS VEHICLE MAPS

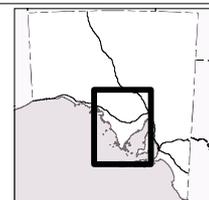


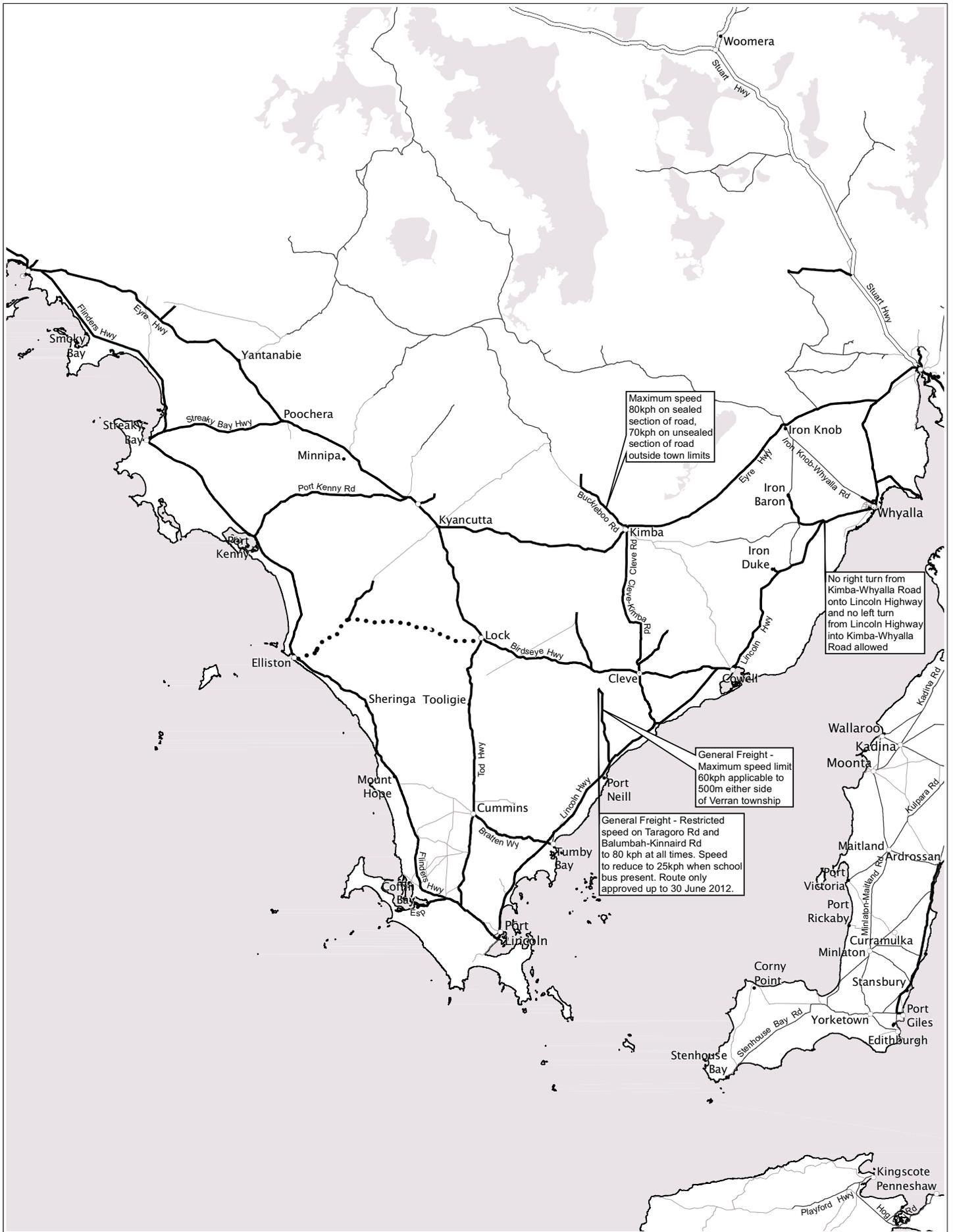
Map: EYRE PENINSULA

4th February 2011

- 23.0m B-Double Vehicle
- 25.0m B-Double Vehicle

Route Network for B-Double Vehicles up to 25.0m in Length Higher Mass Limits (HML)



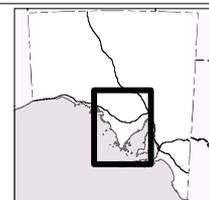


Map: EYRE PENINSULA

4th February 2011

- 32.0m Double Road Train
- 36.5m Double Road Train
- 53.5m Triple Road Train

Route Network for
Road Train Vehicles
Higher Mass Limits (HML)

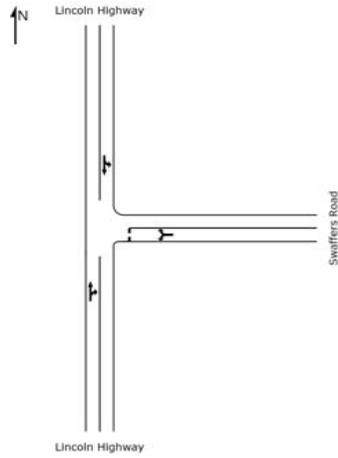




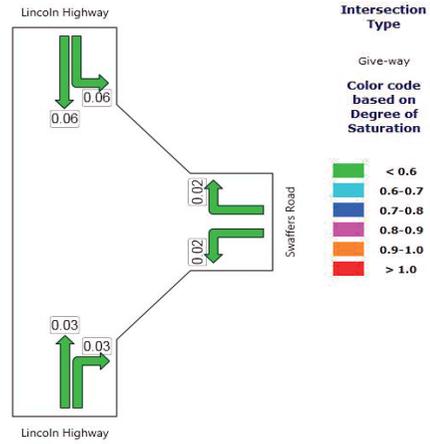
APPENDIX C

SIDRA COMPUTER MODELLING RESULTS

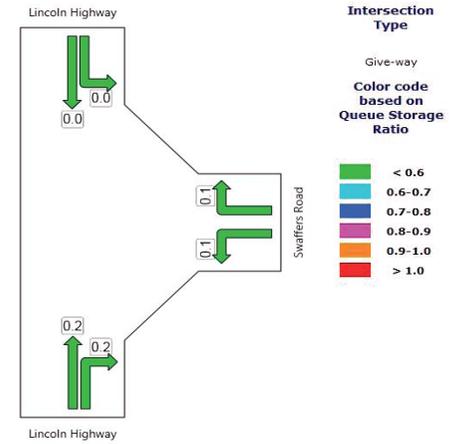
INTERSECTION GEOMETRY



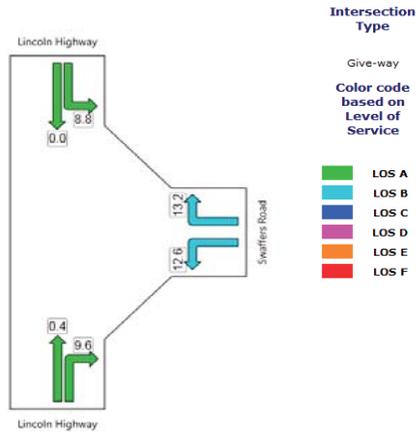
DEGREE OF SATURATION



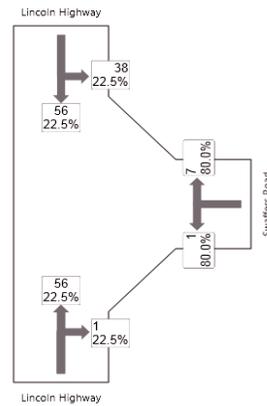
QUEUES (veh)



DELAY & LEVEL OF SERVICE



FLOWS

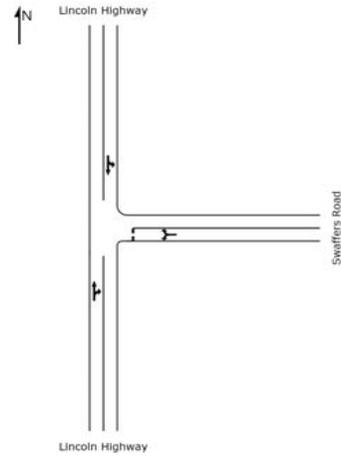


JOB NUMBER:	11-0036
PROJECT NAME:	Sheep Hill Port - Centrex Metals Eyre Peninsula

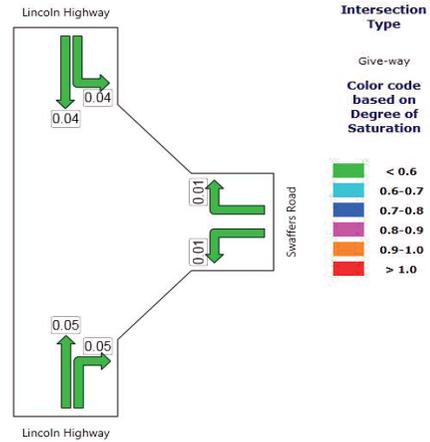
INTERSECTION:	Lincoln Highway/Swaffers Road
SCENARIO:	Forecast AM Peak - Ore from North Existing Layout



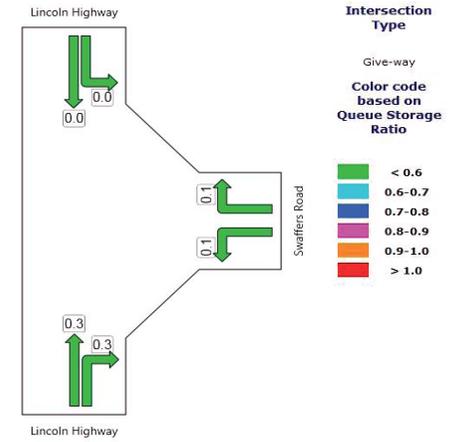
INTERSECTION GEOMETRY



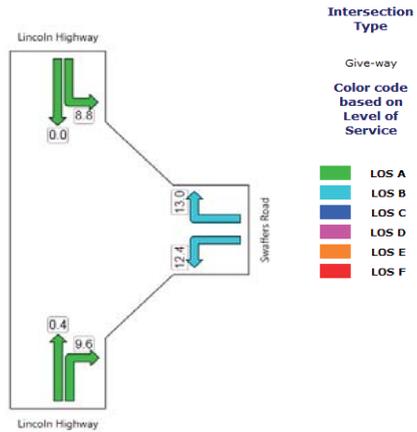
DEGREE OF SATURATION



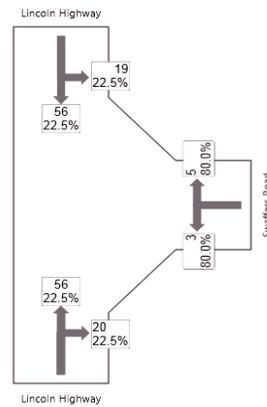
QUEUES (veh)



DELAY & LEVEL OF SERVICE



FLOWS

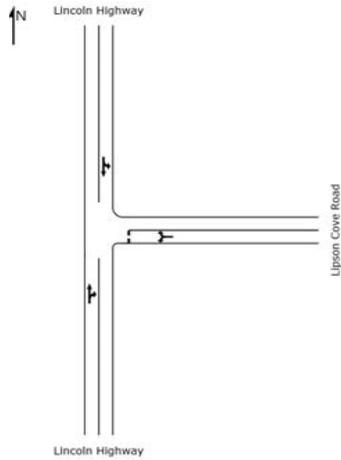


JOB NUMBER:	11-0036
PROJECT NAME:	Sheep Hill Port - Centrex Metals Eyre Peninsula

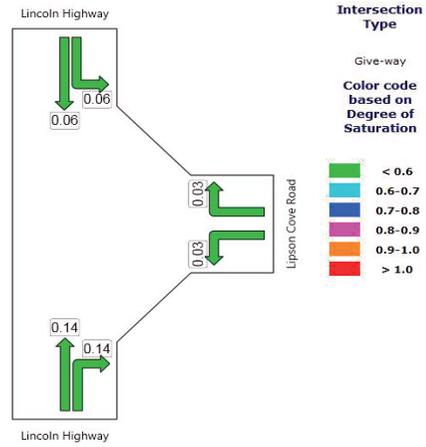
INTERSECTION:	Lincoln Highway/Swaffers Road
SCENARIO:	Forecast AM Peak - Ore from South Existing Layout



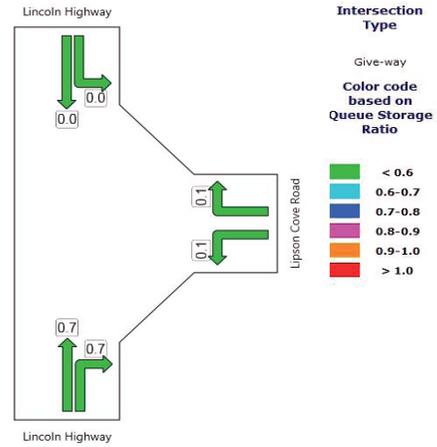
INTERSECTION GEOMETRY



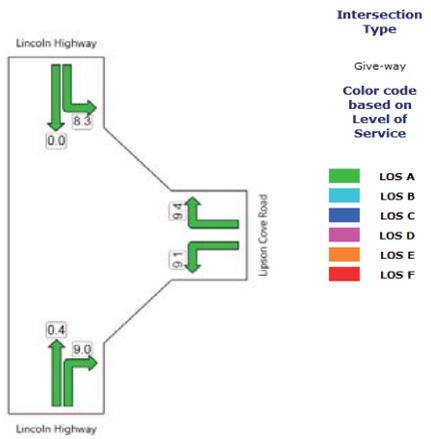
DEGREE OF SATURATION



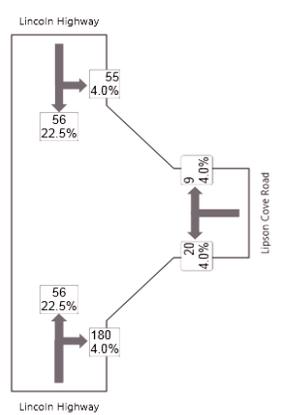
QUEUES (veh)



DELAY & LEVEL OF SERVICE



FLOWS



JOB NUMBER:	11-0036
PROJECT NAME:	Sheep Hill Port - Centrex Metals Eyre Peninsula

INTERSECTION:	Lincoln Highway/Lipson Cove Road
SCENARIO:	Forecast AM Peak Existing Layout

