North Atlantic

Appendix E: Transportation Impact Study and Traffic Management Plan

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Revision History:

Rev.	Section	Date of Revision	Description

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List of Acronyms and Abbreviations

AI	Artificial intelligence
DoTI	Department of Transportation and Infrastructure of Newfoundland and Labrador
GDG	Geometric Design Guidelines for Canadian Roads (2017)
HGP	Hydrogen Generation Plant
HP	Hydrogenation Plant
kV	Kilovolt
LAA	Local Assessment Area
LOHC	Liquid Organic Hydrogen Carrier
MCH	Methylcyclohexane
MW	Megawatt
NARL	North Atlantic Refining Ltd.
NL	Newfoundland and Labrador
NL DECC	Newfoundland and Labrador Department of Environment and Climate Change
NL DOEC	Newfoundland and Labrador Department of Environment & Conservation
NLAQS	Newfoundland and Labrador Air Quality Standards
NLH	Newfoundland and Labrador Hydro
North Atlantic	North Atlantic Refining Corp.
PA	Project Area
TAC	Transportation Association of Canada
TCH	Trans-Canada Highway
the Project	Wind to Hydrogen Project
TIS	Transportation Impact Study
TMP	Traffic Management Plan

1.0 Introduction

North Atlantic Refining Corp. (North Atlantic) is proposing to undertake the development of a Wind to Hydrogen project (the Project) on the Isthmus of Avalon Region in Newfoundland and Labrador (NL). This Project will entail the development, construction, operation and eventual decommissioning of a 324-megawatt (MW) Wind Farm consisting of 45 wind turbines on an undeveloped peninsula situated between Sunnyside and Deer Harbour. The Wind Farm will provide renewable electricity via a 138 kV transmission line to a newly developed Hydrogen Generation Plant (HGP), from where generated hydrogen will be transported to a Hydrogenation Plant (HP) for transformation into a Liquid Organic Hydrogen Carrier (LOHC), which will then be shipped from North Atlantic's port facilities to international markets for use in various decarbonization technologies.

In April 2023, the NL Department of Environment and Climate Change (NL DECC) Environmental Assessment Division, issued its Guidance for Registration of Onshore Wind Energy Generation and Green Hydrogen Production Projects. The intent of this Transportation Impact Study (TIS) and Traffic Management Plan (TMP) is to comply with Section 4.5 (item #4) of the Guidance document.

The purpose of this study is to assess the potential impacts of transporting overweight and oversized materials and equipment over existing roadways associated with the Project. Following a discussion with Department of Transportation and Infrastructure (DoTI) of NL on February 7, 2025, the scope of the TIS and TMP was clarified to reflect DoTI's interest in the impact of overweight and oversized vehicles on the Trans-Canada Highway (TCH) in the study area as well as impacts to the existing Come By Chance weigh station. The traffic impacts related to the Project on the existing road network were evaluated for the Construction, Operation and Maintenance, and the Decommissioning and Rehabilitation Phases of the Project.

The TIS included the review of the location of the proposed Wind Farm access road, the geometric configuration of the proposed intersection with the TCH and a sight line analysis in accordance with the request by DoTI. The TMP discusses management of oversized and overweight vehicles, outlines strategies to manage construction-related travel and disruptions to traffic flow during the Project's implementation.

2.0 Transportation Impact Study

A TIS assesses the impact of a new development on the existing road network through a study of the traffic flow and existing infrastructure, and addresses agencies' safety concerns. For this TIS, the DoTI directed the consultant, GHD, to conduct an analysis of the Wind Farm access road location and the operations and safety associated with the new connection to the TCH.

2.1 Road Infrastructure

The following sections provide an overview of the existing and proposed road infrastructure located within the Project Area (PA) and other roads that will be used during different Project phases.

2.1.1 Trans-Canada Highway (TCH)

The TCH is a provincial highway and is designed to accommodate large volumes of traffic including heavy vehicles. There are multiple interchanges along the highway as well as at-grade intersections. The section of the TCH in the PA is between Arnold's Cove (Exit 26A) and the Come By Chance Weigh Station. This segment is an undivided two-lane, two-way highway with passing lanes on some sections and a posted speed of 100 km/h. There are two interchanges in the PA with one at Arnold's Cove and one at Come By Chance/ Sunnyside. The DoTI adopts a directional reference system that illustrates the east-west alignment of the TCH across NL. As a result, the cardinal direction in the PA which would normally be referenced as northbound is labelled as westbound in this report to refer to towards Gander, while the southbound direction is referred to as eastbound to refer to towards St. John's.

2.1.2 Local Roads

For the Wind Farm, the local road network includes the Bull Arm access road and the proposed Wind Farm access road, which will be used for Project. The Bull Arm access road is owned by the Government of NL and operated by the Crown corporation, Bull Arm Fabrication Inc. The road is a two-way undivided roadway with a single lane per direction with low traffic volumes operating at low speeds and is intended to be used for local traffic serving the Bull Arm Fabrication site. A desktop review of the Bull Arm access road indicates that road is in good condition. The road alignment of the proposed Wind Farm access road will be designed to meet the geometric requirements associated with transporting oversized and overweight vehicles. The design of the Wind Farm access road is further discussed in Section 2.3.

Equipment for the HGP and HP will be delivered via the tug berth adjacent to the PA, and along Refinery Road. Access to Refinery Road / Main Road will be provided through the Arnold's Cove interchange (Exit 26A), which is a -two-way undivided public roadway with a single lane in each direction. A desktop review indicates that the road has minimal physical obstructions such as overhead wires, utility poles,

and signage and the road is in good condition up to the approach to the NARL Logistics Terminal. The existing road infrastructure, including local roads and the TCH, is shown in Figure E-2.1-1.

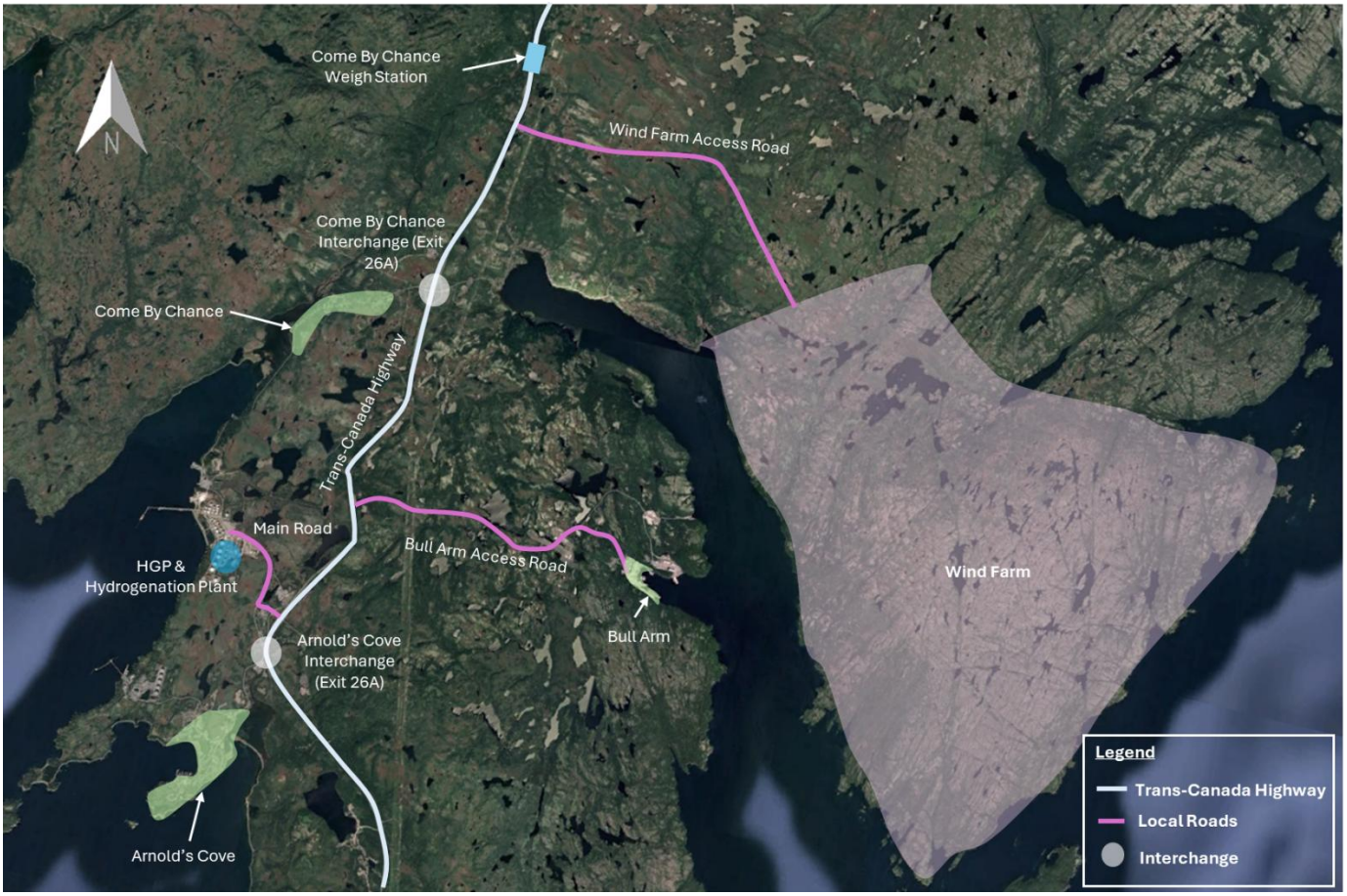

Figure E-2.1-1 Road Infrastructure – Trans-Canada Highway and local roads.

2.2 Existing Traffic

Hourly traffic volumes were collected for a typical weekday (Tuesday, Wednesday, and Thursday) during the summer of 2024, in both the eastbound and westbound directions of the TCH between Arnold's Cove and the Come By Chance Weigh Station. The summer period experienced higher traffic volumes and therefore represents a worst-case scenario, providing a conservative result. Traffic data was collected by SMATS, a firm specializing in smart transportation and data collection analysis. SMATS utilizes crowdsourced probe data sourced from navigation applications and car GPS systems, and an AI-powered analytic platform to supply traffic data (SMATS Traffic Solutions, 2023). The collected data provided hourly traffic volumes for both directions.

The data was analyzed to determine the combined peak hour — the hour during which this section of the TCH experiences the highest total traffic volume in both directions. The combined peak hour was found to occur between 13:00 and 14:00, with a total of 817 vehicles observed: 423 westbound and 394 eastbound.

Additionally, DoTI provided traffic volumes for a single surveyed day, August 3, 2023, totaling 8,866 vehicles. Assuming a 50/50 directional split, this equates to approximately 4,433 vehicles per day per direction. Further assuming that 10% of daily trips occur during the peak hour, which is the typical peak hour distribution factor applied to daily traffic volumes, approximately 443 vehicles per hour are expected in each direction during the peak hour. This estimate aligns closely with the data collected by SMATS; therefore, the SMATS data was adopted for the remainder of the analysis.

2.3 Wind Farm Access Road Design Considerations

The proposed Wind Farm access road location was determined based on the information provided by North Atlantic, and on that basis, the geometric layout of the intersection was developed. Also, a sight distance analysis was completed for the selected location.

An assessment of the nearby intersection at the Bull Arm site determined that this road geometry and layout was suitable for the Project's expected type of vehicles. Therefore, the road geometry layout for the right-in/-right-out type of intersection at the Bull Arm access road can be replicated at the intersection of TCH and the Wind Farm access road. The new intersection for the Wind Farm was designed to meet the Transportation Association of Canada (TAC) and the Geometric Design Guide for Canadian Roads 2017 (GDG) regulatory standards.

2.3.1 Location of Access Road

The proposed Wind Farm access road will be located northeast of Come By Chance, 3.7 km north of the Come By Chance/ Sunnyside interchange (Exit 26B) and 455 m south of the Come By Chance Weigh Station. The GDG states that an access should be located 150 m from the end of a curve and 150 m from the end of an interchange. Furthermore, recommended ramp terminal spacing is a minimum of 350 m between two successive exits from the freeway. This requirement is satisfied with the proposed access location, where the Come By Chance Weigh Station exit is situated 380 m downstream of the Wind Farm access road.

2.3.2 Intersection Layout

The TCH will require modifications at the Wind Farm access road connection to meet the geometric requirements for vehicles turning at the intersection. A right-turn auxiliary lane will be required to minimize

hazards and inconveniences and promote operating efficiency for vehicles exiting or entering the freeway, according to the GDG by the TAC. The GDG states that the auxiliary lane is intended to separate the through and right-turn traffic well in advance of the intersection, thereby preventing deceleration of the vehicular flow on the through lane.

The proposed intersection includes one through lane per approach in both the westbound and eastbound directions. To accommodate westbound right-turn movements, a deceleration channelized auxiliary lane with a taper will be incorporated. For vehicles exiting the Wind Farm access road, a direct tapered acceleration lane will be provided on the TCH in the westbound direction. The taper of this acceleration lane is expected to terminate prior to the Come By Chance Weigh Station influence area. The design of the deceleration for the proposed right-in/right-out intersection, considered 60-meter turning radius for the wind turbine's blade delivery vehicles. The design of the acceleration lane for the proposed right-in/right-out intersection, requires a smaller turning radius since the empty vehicles will have a hydraulic arrangement to reduce the length of the trailers.

As indicated by the DoTI, a right-in / right-out configuration at the Wind Farm access road should be implemented due to the TCH twinning project scheduled for between 2026 and 2029. The twinning project will introduce a central median in the highway, which will restrict eastbound vehicles from using the Wind Farm access road. The presence of the central median will restrict the left-in and left-out movements at the TCH and Wind Farm access road intersection.

Due to the median, personal and construction vehicles traveling eastbound towards the Wind Farm will continue east past the intersection, take the off-ramp at Come By Chance/ Sunnyside (Exit 26B), and use the underpass on Come By Chance Main Road to rejoin the Trans-Canada Highway westbound to enter the Wind Farm construction site through the right-in/right-out intersection at the Trans-Canada Highway and the Wind Farm access road. Vehicles with an eastbound destination will first exit onto the TCH in the westbound direction, then adjust their travel to the eastbound direction via a turnaround, potentially at Goobies. A desktop review of on-line images of the underpass at the interchange indicates that the underpass does not have any height or width restrictions making it suitable for construction traffic. Vehicles returning to Bull Arm after delivering wind turbine components will be directed westbound through the right-in/right-out intersection and will execute a turn at the Come By Chance Weigh Station, with the assistance of escort vehicles, before heading eastbound towards Bull Arm.

The design speed for the highway was determined based on the completed traffic survey. The 85th percentile surveyed speeds were 118 km/h westbound and 119 km/h eastbound. Therefore, a design speed of 120 km/h was adopted for the design of the TCH at the intersection with the Wind Farm access road. With this design speed, the acceleration lane will terminate before reaching the influence area of the Come By Chance Weigh Station, and the Wind Farm access road intersection will be located at a sufficient distance from the Come By Chance Weigh Station. The proposed intersection layout,

consistent with the GDG, is shown in Figure E-2.3-1. The access road will be constructed with a deceleration lane and acceleration lane, which will both be paved, and therefore gravel will not be able to be tracked on the TCH.

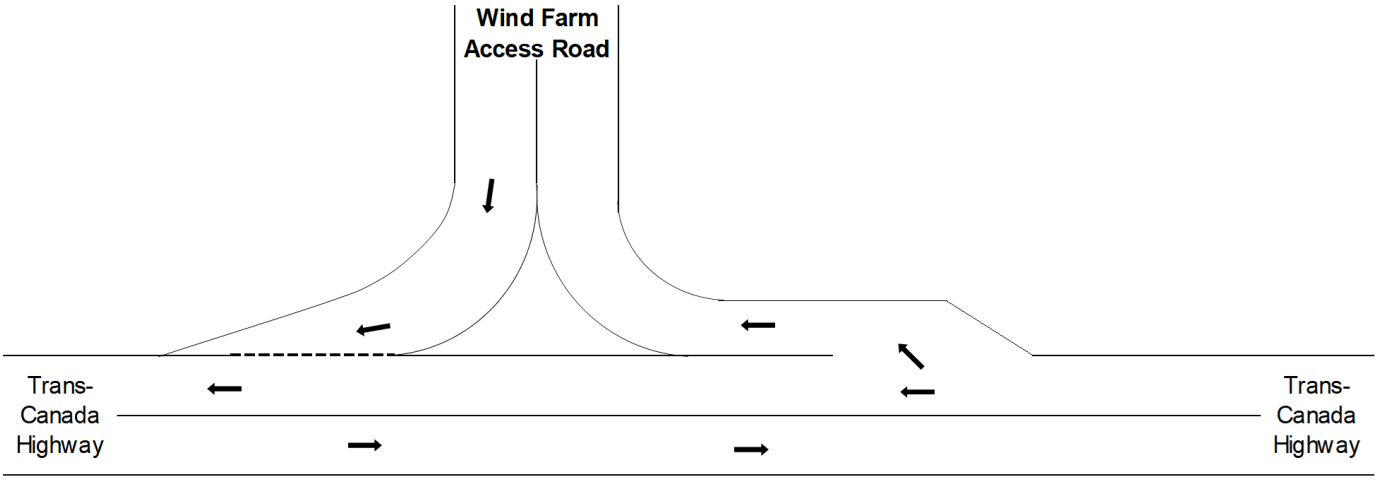

Figure E-2.3-1 Trans-Canada Highway and Wind Farm access road – geometric configuration.

2.3.3 Sight Distance Calculations

A sight distance assessment for the proposed Wind Farm access road location was undertaken in accordance with Chapter 9 of the GDG. The required sight distance was determined for the three cases of left-turn and right-turn from the stop on the Wind Farm access road and for a left-turn from the TCH for a passenger car and a combination truck (WB 19 and WB 20) with the results summarized in Table E-2.3-1. Even though the Wind Farm access road is expected to allow only right-turn movements, the left-turn sight distance calculations were also reviewed. The GDG outlines the procedure for calculating intersection sight distance, which depends on the time gap required for vehicles on the minor road to safely enter the major road. For long and oversized trucks, the appropriate time gap should be determined by the road authority, according to the GDG. In this study, a combination truck was selected as the design vehicle.

The design speed was determined based on the completed traffic survey. The 85th percentile surveyed speeds were 118 km/h westbound and 119 km/h eastbound. Therefore, a design speed of 120 km/h was adopted for this analysis. The elevation profile of the highway segment near the intersection indicates an average grade of -4% in the westbound direction.

Table E-2.3-1 Intersection sight distance - initial road access location.

Access	Case	Required Intersection Sight Distance - Passenger Car (GDG 2017)	Required Intersection Sight Distance - Combination Truck (GDG 2017)	Available Intersection Sight Distance
Trans-Canada Highway and Wind Farm Access Road	B1: Vehicle Turning Left from Stop	250	385	206 m (inadequate)
	B2: Vehicles Turning Right from Stop	215	350	206 m (inadequate)
	F: Left-Turn from Major Road	185	250	206 m (acceptable)

The available intersection sight distance was determined from a desktop review of road images. The available sight distance is less than the sight distance required for passenger cars and combination trucks for the cases of left-turn and right-turn from stop. However, with the geometric layout shown in Figure E-2.3-1, the right-turn acceleration lane would allow a vehicle to enter the TCH without needing to meet the sightline requirements for a stop condition.

Therefore, the intersection could be designed as a right-in/right-out intersection with an acceleration lane leading to a merge onto the TCH. The design of the intersection will be completed to comply with appropriate design standards.

2.4 Construction Phase Traffic

The peak hour analysis is a key component of transportation planning and helps identifying the hour of the day with the highest traffic volumes at an intersection. Therefore, as a conservative approach, trips generated by the Project were all assigned to the peak hour to simulate the worst-case scenario and verify whether the road infrastructure is appropriately designed.

2.4.1 Wind Farm Traffic

The different activities during the Construction Phase (Wind Farm access road construction and wind turbine mounting) will increase traffic on the TCH. The vehicles transporting staff, equipment, parts and heavy machinery will all contribute to additional traffic on the highway. The Wind Farm access road will be used by heavy vehicles during the Construction Phase to carry various parts of the forty-five wind turbines to be erected as part of the Wind Farm. Once the Project moves into the Operation and Maintenance Phase, the road will be used for maintenance vehicles conducting routine servicing and monitoring of the Wind Farm.

Two cranes will be delivered to the Wind Farm using the TCH and the Wind Farm access road. The cranes will offload and erect wind turbine components at the Wind Farm with typically two cranes assisting with one wind turbine but once at the Wind Farm, the cranes will not access the TCH. The wind turbines will be transported from the Bull Arm area along the TCH to the PA. Forty-five wind turbines are expected to be mounted at the Wind Farm and construction traffic will be affected by the construction procedures for each wind turbine. The wind turbine parts will be delivered in segments and mounted at the specified locations. Dedicated trucks/ trailers are assigned to transport the different segments of the wind turbine (Hatch 2024).

The wind turbines will be mounted in sequence, allowing delivery of components to the PA in stages. Each wind turbine consists of ten (10) components as indicated in Table E-2.4-1. The Wind Farm is expecting to have 45 wind turbines resulting in a total of 495 vehicular trips, assuming each vehicle can deliver one component. Two types of Schnabel delivery vehicles are anticipated for this Project: one for blade transport and the other configured for remaining wind turbine components. While the cargo may differ, both will utilize Schnabel-type transport systems due to their ability to carry oversized loads. The construction schedule provides 18 months for the delivery and installation of Wind Farm components. During this period, an estimated 135 trips will be required for blade transportation and 360 trips for the delivery of other components. To meet the installation schedule, it was assumed that one Schnabel-type vehicle will be dedicated to blade transport, while two Schnabel-type vehicles will be allocated for transporting other components, assuming each vehicle completes one trip per day, which was an assumption based on the delivery and installation schedule.

Therefore, a total of 270 trips to/from the Wind Farm are required for the blade delivery trucks and 720 return trips are needed for other components, assuming two Schnabel-type vehicles are commissioned for this task.

Table E-2.4-1 Wind turbine components.

Wind Turbine Components	Number of Vehicles per Wind Turbine	Total Project Trips
1 x Nacelle	1	45
1 x Hub	1	45
3 x Blades	3	135
6 x Tower Sections	6	270
Total	**10**	**495**

Construction vehicles such as excavators, concrete trucks, and compactors will also be used in the Construction Phase to build the Wind Farm access road and the wind turbine foundations. The TCH, Bull Arm access road, and Wind Farm access road are suitable to for the construction vehicles. This will result in an estimated 30 trips to/from the Wind Farm construction site daily, within the construction operating hours between 7 AM and 3 PM, thus averaging four vehicles per hour.

The travel time for the 9 km on the TCH between the Bull Arm access road and the proposed Wind Farm access road is estimated as 6 minutes. Passing lanes are provided for approximately 6.3 km, while a single westbound lane is available for 2.7 km. Whereas most of the construction traffic is expected to travel at highway speeds and due to the ability for a vehicle to pass any construction traffic over most of the distance, no impact on the travel time is expected for the majority of the road segment. Vehicles travelling at less than highway speed will be accompanied by escort vehicles, per the **Highway Traffic Act**. If there is traffic travelling behind slower construction vehicles in the single lane section, the additional travel time is determined to be 53 seconds for a speed of 60 km/h, 30 seconds for a speed of 70 km/h, and 13 seconds for a speed of 80 km/h. Similarly, in the eastbound direction, in the single lane section of 2.8 km, if a vehicle is behind slower construction traffic, there would be an increase in travel time of 56 seconds if the construction vehicle is travelling at 60 km/h, 32 seconds for a speed of 70 km/h, and 14 seconds for a speed of 80 km/h.

Trips travelling in the westbound direction on the TCH will turn right at the intersection of the TCH with the Wind Farm access road. Since the eastbound left-turn movement at the TCH and Wind Farm access road intersection will not be permitted in the future due to the twinning project which introduces a central median in the highway, trips in the eastbound direction will have to drive past the Wind Farm access road to the Come By Chance interchange and use the interchange to return to the Wind Farm access road intersection. Vehicles exiting the Wind Farm in the westbound direction will use the intersection to head west toward their destination. Vehicles with an eastbound destination will first exit onto the TCH in the westbound direction, then adjust their travel to the eastbound direction via a turnaround, potentially at Goobies.

During the Construction Phase, an estimated 100 workers will enter the Wind Farm construction site daily. For similar projects in NL, shuttle buses were hired to transport workers to and from the site, and it was assumed that the contractor would adopt a similar approach by using shuttle buses with a capacity of 30 workers each. As a result, four buses would be required. To provide a conservative estimate, it was assumed that all four buses would arrive at the site within the same hour, resulting in four trips during the peak hour. Alternatively, if shuttle buses are not used, each worker would arrive individually, resulting in 100 vehicle trips entering the site. However, this scenario is not expected to cause any capacity issues at the intersection. It was also assumed that 10 additional individual trips will occur in the peak hour and represent the trips made by contractors, inspectors, surveyors, and supervisors. These trips were assumed to occur during the peak hour to generate the most conservative traffic volumes and design for worst-case conditions.

The total traffic at the intersection of the TCH and the Wind Farm access road will consist of existing traffic traveling east-west on the highway, as well as construction traffic accessing the Wind Farm. Peak hour traffic volumes at this intersection during the Construction Phase are summarized in Figure E-2.4-1.

The turning movement volume at the intersection of the TCH and the Wind Farm access road is minimal and will not result in capacity or operational issues to either road.

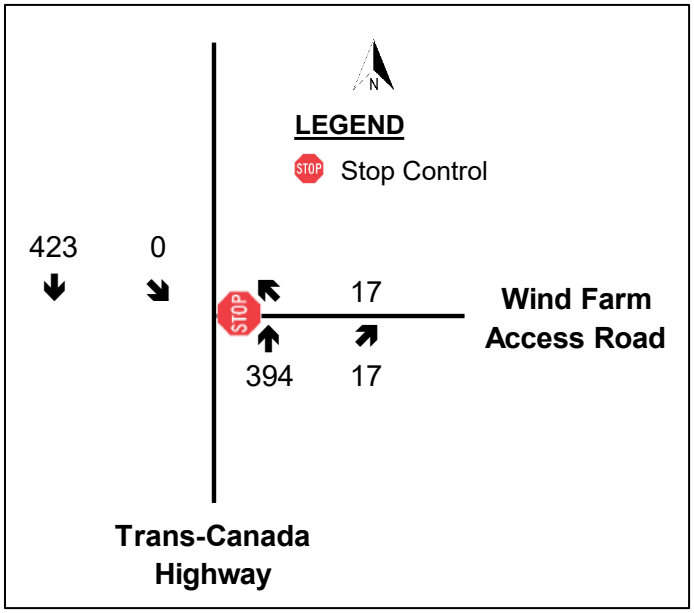

Figure E-2.4-1 Construction scenario – peak hour traffic volumes – Trans-Canada Highway & Wind Farm access road.

2.4.2 Hydrogen Generation Plant and the Hydrogenation Plant Traffic

The HGP and the HP will be located west of the TCH, within the NARL Logistics Terminal boundaries. While the plants are expected to generate additional traffic during the Construction Phase, the increase will be minimal and is not anticipated to cause any capacity constraints. Traffic resulting from construction activities will only include trucks, buses and vehicles transporting materials and staff. Most of the equipment and parts will be delivered via the tug berth.

The majority of traffic heading to the Plant will travel through the Arnold's Cove interchange. In the westbound and eastbound directions, the off-ramps intersect with Main Road at an unsignalized and stopped controlled intersection. Vehicles will then travel towards the Plant along Main Road and use the channelized right-turn lane at the intersection of Refinery Road and Main Road and then Refinery Road to reach their destination. Trips departing from the Plant will use the Arnold's Cove interchange, take the on-ramp to the TCH to travel either westbound or eastbound, depending on their destination.

2.5 Operation and Maintenance Phase Traffic

Operation and maintenance activities will generate minimal traffic on the TCH, the Bull Arm access road, the Wind Farm access road, and the Main Road/ Refinery Road. The traffic will generally be related to staff destined for the PA who will use personal vehicles. For the HGP and HP, delivery of large or oversized components will occur via the tug berth with a minimal increase in traffic not resulting in any capacity issues.

2.6 Decommissioning and Rehabilitation Phase Traffic

At the end of the Project's lifespan, the Decommissioning and Rehabilitation Phase of the Wind Farm will include the dismantling and removal of wind turbine components. This process will require the use of similar vehicles as those used during installation. Large components will be transported to and from the Bull Arm site during decommissioning. However, route selection will need to consider the future configuration of the TCH based on DoTI's TCH improvement and widening project. Following the removal of infrastructure, the Wind Farm area will be rehabilitated and restored, and the Wind Farm access road may be dismantled. It is unknown at this time how the HGP and HP will be decommissioned. It is likely that the traffic during this phase will be similar to the Construction Phase as the plants are decommissioned.

2.7 TIS Conclusion

The TIS assessed the geometry and the location of existing and proposed road infrastructure to accommodate oversized vehicles associated with the Project. The scope of the TIS was developed based on discussions with DoTI. A trip generation analysis was conducted for the Project during the Construction Phase and resulted in additional traffic for road construction and wind turbine installation. The projected traffic volumes are minimal, and no operational issues are expected on the TCH, the Wind Farm access road, the Bull Arm access road and at the Arnold's Cove or Come By Chance interchanges. There will be minimal road usage by trips generated by the HGP and HP since the majority of materials and equipment will arrive on site from the tug berth.

The intersection geometry for the Wind Farm access road is in accordance with the GDG guidelines, incorporating a channelized right-turn auxiliary lane for access to the Wind Farm and a direct taper for exiting movements. The traffic movements at the Wind Farm access road intersection will not impact operations at the Come By Chance Weigh Station. The intersection is designed to facilitate the turning movements of oversized vehicles.

The projected trips on existing roadways are expected to have manageable impacts throughout all phases of the Project including Construction, Operation and Maintenance, and Decommissioning and Rehabilitation. With proper planning and adherence to regulatory requirements, the integrity of the road network and public safety can be maintained throughout the Project lifecycle.

3.0 Traffic Management Plan

The TMP reviews the potential impacts of oversized and overweight vehicles to be used for the Project and describes the measures intended to minimize impact on the road network during all phases of the Project. The TMP presents the measures that will be implemented to manage the transportation of oversized and overweight Project materials and equipment in vehicles on the roadways. A description of the road infrastructure and traffic volumes associated with the Project are outlined above in Section 2.0.

3.1 Oversized and Overweight Materials, Equipment and Vehicles

The existing roads and intersections between the TCH and the PA were originally designed for heavy vehicles and the design is therefore expected to be adequate for most of the anticipated construction traffic. An Overweight and Over Dimensional Special Permit is required for vehicles that exceed the designated limits listed in the Vehicle Regulations, 2002 under the **Highway Traffic Act** and in Schedule A and B. Vehicle dimensions, wheelbase, overhangs, axle weight, and tire loading are all elements that could lead to the need for a Special Permit. The characteristics of the transport vehicles used for the Project will be reviewed to determine if a Special Permit is required. Other permits will be required for slow moving vehicles or for an over mass mobile crane. For reference, the vehicle weight limits from Schedule A are summarized in Table E-3.1-1.

Table E-3.1-1 Schedule A – Axle weight limits.

Axle Type	Application	Spread Range	Weight Limit
Steering	Straight Truck Intercity Bus Tractor	N/A	8,000 kg – 5,500 kg
Tandem Steering Axle (driver-controlled)	Straight Truck	1.2 m to 2.2 m	16,000 kg
Single (non-steering axle)	Single Tires (<445 mm) Single Tires (≥445 mm)	N/A	6,000 kg – 9,100 kg
Tridem Axle (including tandem equivalent axles)	Truck, Tractor or trailer - Dual Tires	Less than 1.2 m 1.2 m to 1.85 m	9,100 kg 18,000 kg
	Truck, Tractor or trailer - Single Tires (width ≥445 mm)	Less than 1.2 m 1.2 m to 1.85 m	7,700 kg 15,400 kg
Tridem Axle (including tridem equivalent axles)	Trailers – Dual Tires	Less than 2.4 m 2.4 m ≤ to <3.0 m 3.0 m ≤ to <3.6 m 3.6 m to 3.7 m	18,000 kg 21,000 kg 24,000 kg 26,000 kg
	Trailers – Single Tires (width ≥445 mm)	Less than 2.4 m 2.4 m ≤ to <3.0 m 3.0 m ≤ to <3.6 m 3.6 m to 3.7 m	15,400 kg 21,000 kg 23,000 kg 23,100 kg
Triaxle Axle (model year 2003 and newer)	Trailers	3.0 m to 4.8 m	18,000 kg

The maximum weight and dimension limits for the Special Permit for a single trip or an annual permit is listed in Table E-3.1-2. Vehicle loads exceeding the weight limits specified for a single trip will require additional review and approval from the Minister.

Table E-3.1-2 Special Permit Requirements from the Vehicle Regulations, 2002.

Trip	Maximum Weight	Max Dimensions	Overhang
Single Trip Permit	70,000 kg (regular single trip) 120,000 kg (single trip two-vehicle concept)	Width: 4.88 m Height: 4.88 m Length: 35 m	Front: 3.1 m Rear: 6.2 m
Annual Permit	64,000 kg	Width: 4.27 m Height: 4.5 m Length: 30 m	Front: 3.1 m Rear: 5.5 m

During the Construction Phase, construction vehicles and heavy equipment such as excavators, cranes, and concrete trucks will operate on the TCH and Wind Farm access road, with the majority of these vehicles being highway capable. Flatbeds are commonly used to transport construction vehicles with limited road mobility capabilities. The combined weight of these trailers can range between 2 and 35 tonnes depending on the vehicle it is carrying. Four component types are necessary to install one wind turbine: tower section, blades, nacelle, and power hub. Table E-3.1-3 shows the loads for the wind turbine components and the expected permit type required.

Table E-3.1-3 Special Permit Requirements for Project Specific Vehicles.

Vehicle	Transported Components	Total Weight	Permit Required
Schnabel Trailer	Tower Section	119,000 kg	Single Trip Permit
	Blade	64,000 kg	Annual Permit
	Nacelle	126,000 kg	Excessive over mass vehicle, requires additional review
	Hub	103,440 kg	Single Trip Permit

All oversized and overweight vehicles planned to be used for the Wind Farm construction will travel along the TCH from the Bull Arm site to the Wind Farm access road. The existing road geometry, including turning radius and vertical and horizontal alignment, will be assessed to verify the ability for the wind turbine blades to manoeuvre, given the size of the wind turbine components. The road alignment of the proposed Wind Farm access road will be designed to meet the geometric requirements associated with transporting oversized and overweight vehicles. There are no physical impedances to oversized or overweight vehicles in the PA section of the TCH with no bridges or underpasses. There is one overpass located at the Come By Chance interchange.

While the use of oversized and overweight vehicles is not anticipated during the HGP or HP Construction Phase, the roadways associated with the PA appear capable of accommodating such vehicles, with no significant pinch points identified along the route. Construction traffic that does not require a special permit is highway-capable and can therefore travel over the overpass at the Arnold's Cove interchange (Exit 26A). However, if oversized and overweight vehicles are required to deliver equipment to the HGP or the HP, a permit will be requested. Culverts along the travel path of oversized and overweight vehicles will be identified and then inspected by a qualified inspector. If any culvert is found to be structurally inadequate to support the anticipated loads, appropriate reinforcement measures will be implemented.

For the wind turbine maintenance, no overweight or oversized vehicles are required except when large parts need to be replaced. In that case, the applicable permits will be requested.

The measures intended to minimize impact on the road network during all phases of the Project include obtaining required permits and approvals from relevant authorities, conducting route assessments, and reinforcing critical infrastructure.

3.2 Driver Education

Driver education and awareness are essential for the safety of both equipment operators and the broader community. All drivers will undergo safety orientation and informational sessions to understand the specific risks associated with their tasks. North Atlantic will conduct regular safety briefings to address any operational or safety issues and highlight key concerns related to upcoming activities. Additionally,

all other road users including Project staff, contractors, and visitors will remain aware of potential road hazards and consistently adhere to traffic regulations and safety standards.

3.3 Driver Conditions

All drivers engaged as part of this Project, whether driving light or heavy vehicles, will adhere to the following policies:

- Ensure all licenses and permits are current;
- Adhere to the roadway rules and regulations;
- Ensure all vehicles are properly maintained and are safe to operate;
- Respect the road space needed by the general traffic and maintain safe space on the TCH;
- Follow all the designated traffic control measures;
- Turn off all flashing and rotating warning light beacons when on public roadways, unless required;
- Maintain safe traveling distance from other vehicles and avoid traveling in convoys, unless required;
- Drive in full compliance with this TMP; and
- Complete driver awareness and road safety trainings.

3.4 Traffic Control Measures

Traffic control measures are proposed to mitigate the risk to the safety for the travelling public. Traffic control measures to be implemented include the following:

- **Road Closures:** Road closures are not expected.
- **Scheduling:** PA access and wind turbine delivery will be scheduled to avoid or reduce impact to the TCH. Activities with major impact on the road network will be completed in the off-peak periods to avoid conflict with the peak vehicular demand.
- **Illumination:** The requirement for illumination is dependent on the delivery and construction operating hours. If some activities will occur at night, temporary illumination is required on key curvatures and near hazardous obstacles on the Wind Farm access road. This will depend on the Wind Farm access roads horizontal and vertical alignment.
- **Signage:** Signage required for temporary conditions, as specified in the Traffic Control Manual 2018 (DoTI), must be installed on both public and private roads in accordance with the applicable guidelines.
- **Escort Vehicles:** The **Highway Traffic Act** requires the presence of escort vehicles to assist large vehicles above a certain load to travel along public roads with all the necessary permits to be obtained in advance.

- **Flag Person:** Flag persons, equipped with the appropriate tools, are to be located at conflict points when required. The flag person requirement will follow the requirements as stated in the Traffic Control Manual 2018 (DoTI).
- **Parking and Laydown Area:** These areas should be away from any public roads, whenever possible, to avoid disruption to traffic. Multiple laydown areas are proposed for the Project including:
    - Wind Farm: Two laydown areas have been proposed for the Wind Farm, with one at the Bull Arm facility and the other near the PA along the Wind Farm access road.
    - HGP: Laydown area is suggested near the HGP PA and at the Port of St. John's.
- **Pedestrian and Cyclist accommodation:** Pedestrians and cyclists are not expected to use the TCH, Wind Farm access road, and Bull Arm access road. The existing road infrastructure does not provide adequate space for pedestrians and cyclists. Therefore, no accommodation is required during the Construction Phase since the Wind Farm and Plants will not generate walking trips.
- **Public Information Strategy:** This strategy consists of implementing a communication plan to inform residents and drivers about activities that are disruptive to traffic.
- **Wildlife Mitigation:** Strategies should be implemented to reduce the risk of collision with wildlife and disturbance to the ecosystem. This will include reduced speed limits on the Wind Farm access road and clear visibility lines along the road.

3.5 Monitoring and Reporting

The Project will include an incident and complaint reporting strategy as part of the community outreach and Project participation. North Atlantic will document incidents and complaints raised by community members. To keep the public informed, the Project team will engage the public via notifications and a community communication program. Activities will require compliance with the federal, municipal, and provincial authorities. Proper signage and temporary traffic measures will be implemented and will follow the standards set in the Traffic Control Manual 2018 by the DoTI.

4.0 References

HATCH Ltd (2024). NARL Wind to Hydrogen Project Pre-FEED Report.

Transportation Association of Canada. (2017). *Geometric Design Guide for Canadian Roads: Chapter 10 – Interchanges*.

Service NL, Motor Vehicle Division (2001). Vehicle Regulations, 2001 under the Highway Traffic Act. https://www.assembly.nl.ca/legislation/sr/regulations/rc010081.htm

Highway Design and Construction Division (2018) Traffic Control Manual. Newfoundland and Labrador Department of Transportation and Infrastructure. - https://www.gov.nl.ca/ti/files/publications-traffic-control-2018.pdf

SMATS Traffic Solutions. (2023). About us | SMATS. https://www.smatstraffic.com/about-us/

Digital Government and Service NL. (n.d.). *Overweight and Over Dimensional Special Permits*. Government of Newfoundland and Labrador. Retrieved from:

https://www.gov.nl.ca/motorregistration/commercial-vehicles-and-drivers/overweight-and-over-dimensional-special-permits/