



**Freight Program Implementation  
Support Services – Statewide  
COVID-19 and Unplanned  
Emergencies' Impacts on Freight  
and Steps Towards Freight  
Resiliency in Nevada FINAL**

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# 1 INTRODUCTION

The impacts of COVID-19 highlights that external factors and unplanned emergencies can have a dramatic impact on both the demand for freight services and the usage of freight infrastructure. The sources, locations and quantities of both inputs and final demand altered dramatically for many commodities and the supply chains continue to adapt to these demand changes. The corresponding dramatic rise in e-commerce has increased demand for urban distribution centers changing land use and truck travel patterns in local communities across Nevada. Additionally, COVID-19 forced significant changes in how the Nevada Department of Transportation (NDOT) staff operate which in turn impacted the type of freight planning and operational support that can be conducted.

## 1.1 Structure of Document

The remainder of this document is structured into three chapters:

### CHAPTER 2

Chapter 2 – describes the impact of COVID-19 on freight flows and freight infrastructure in Nevada along with summarizing the impacts of COVID-19 on NDOT operations.

### CHAPTER 3

Chapter 3 – discusses the implications of COVID-19 on system resiliency for freight operations in Nevada through examination of organizational resiliency at a broad scale.

### CHAPTER 4

Chapter 4 – provides high-level recommendations that will enable NDOT to prepare for freight-related system disruptions at the scale of COVID-19.

## 2 IMPACTS OF COVID-19 ON FREIGHT FLOWS AND FREIGHT INFRASTRUCTURE

### 2.1 Impacts of COVID-19 on Freight Flows

The COVID-19 pandemic resulted in significant changes in traffic flows in Nevada. The Nevada Governor declared a state of emergency in March of 2020 including the closure of non-essential businesses to assist in preventing the spread of the coronavirus. Overall traffic volumes and truck traffic volumes decreased in conjunction with these restrictions.

Figure 2-1 through Figure 2-4 compare average monthly traffic volumes on I-80 in the Reno region and I-15 in the Las Vegas region for total traffic and truck traffic in 2020 and 2019. On I-80 in Reno, the total traffic volume in March of 2020 was just over 100,000 daily vehicles which represents a decrease of approximately 25 percent compared to traffic in March 2019 at the same location. Total traffic for April of 2020 was more than 40 percent lower than it was for 2019 on I-80 in Reno. Similar decreases occurred on I-15 in the Las Vegas region with March and April of 2020 showing declines of 17 percent and 33 percent respectively compared to 2019 as shown in Figure 2-3.

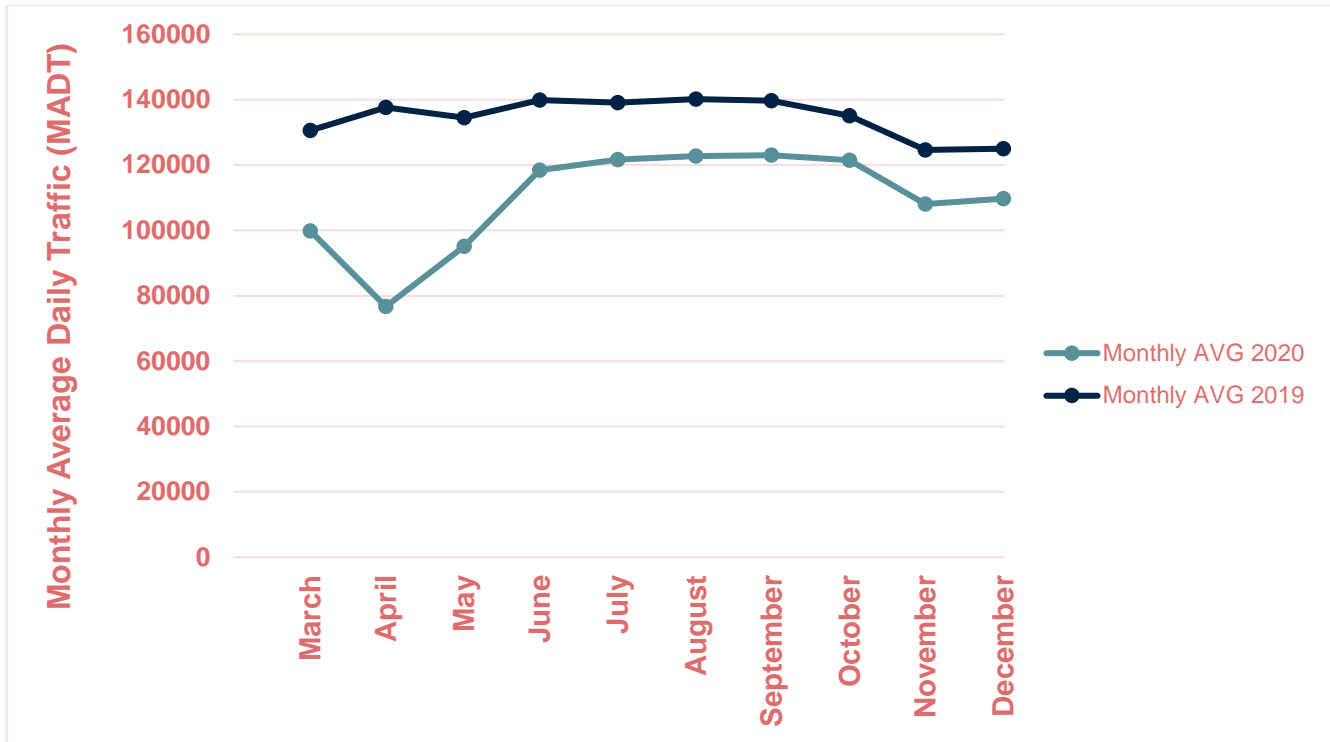
Truck volumes experienced lower levels of fluctuation due to COVID-19 relative to total traffic volumes. By the fall of 2020, truck volumes were higher than 2019 levels, while total traffic volumes remained 10 percent lower in 2020 relative to 2019.

Changes in truck traffic were far less dramatic than the declines experienced in total traffic volumes. Figure 2-2 shows that truck traffic on I-80 for March of 2020 was roughly equivalent to that of March 2019. April 2020 truck volumes decreased by 10 percent relative to April 2019 on I-80. On I-15 in the Las Vegas region, decreases in truck volumes for March and April of 2020 were less than 10 percent.

Total traffic volumes began to increase rapidly in May of 2020 as Nevada began reopening non-essential businesses. By June of 2020, traffic volumes on I-80 were within 15 percent of 2019 levels and by December of 2020, traffic volumes were close to 10 percent of 2019. On I-15, traffic volumes rebounded to within 10 percent of 2019 levels by June of 2020 and remained in that range through the end of 2020.

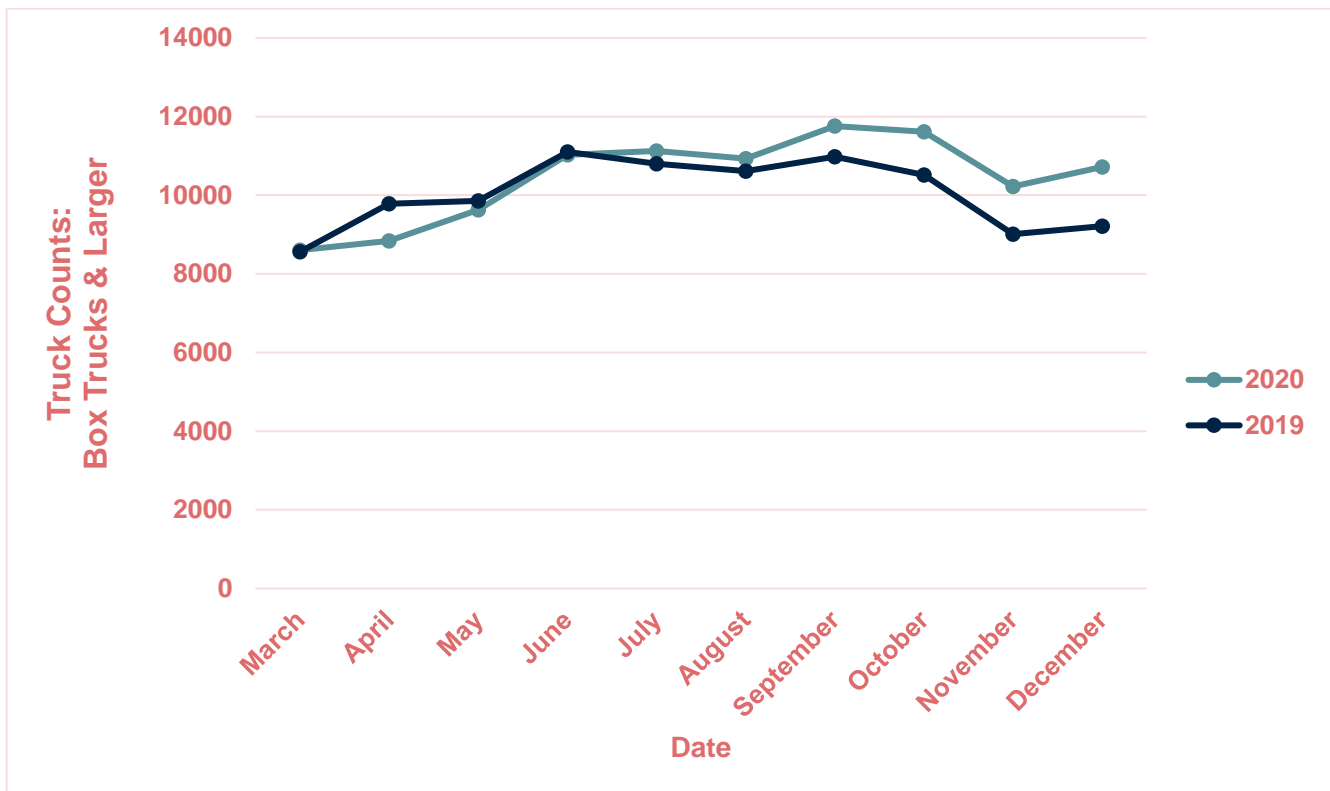
Truck volumes in 2020 also increased during Nevada's reopening such that 2020 volumes exceeded 2019 volumes in June on I-15 and September on I-80. This reinforces that truck traffic was much less dramatically impacted by COVID-19 relative to total traffic volumes.

Figure 2-1: Monthly Average Daily Traffic 2019 and 2020 at I-80 in Reno



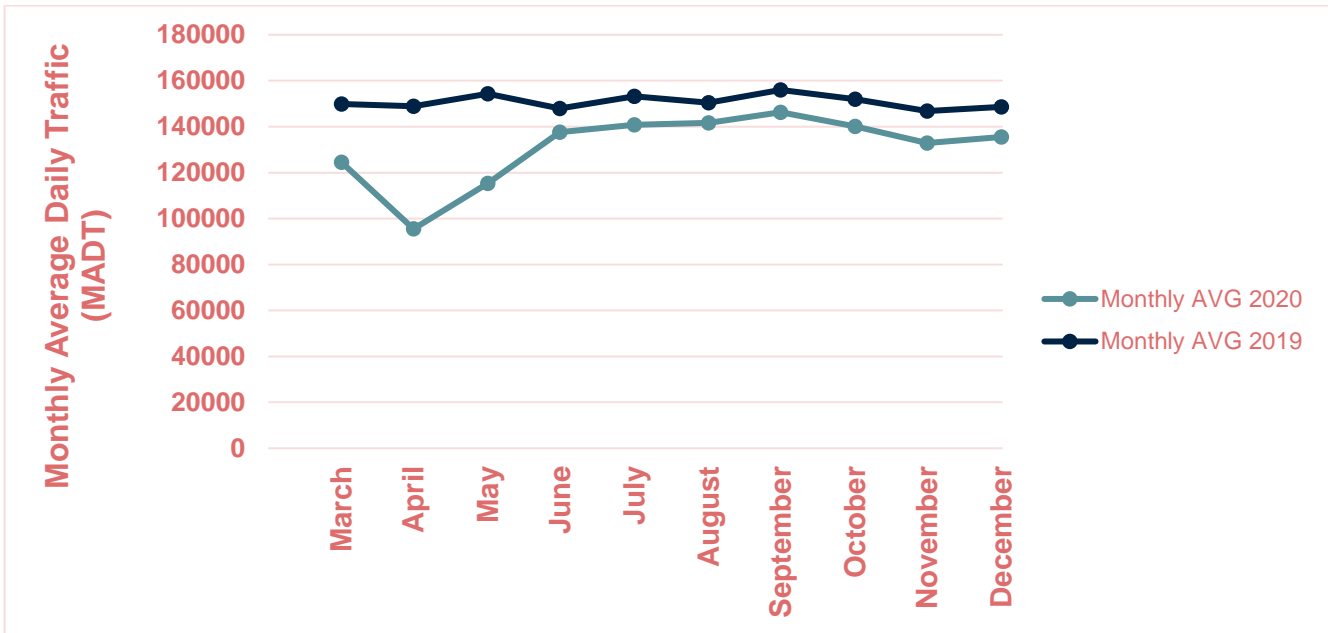
Source: NDOT Traffic Information Systems

Figure 2-2: Monthly Average Daily Truck Traffic 2019 and 2020 at I-80 in Reno



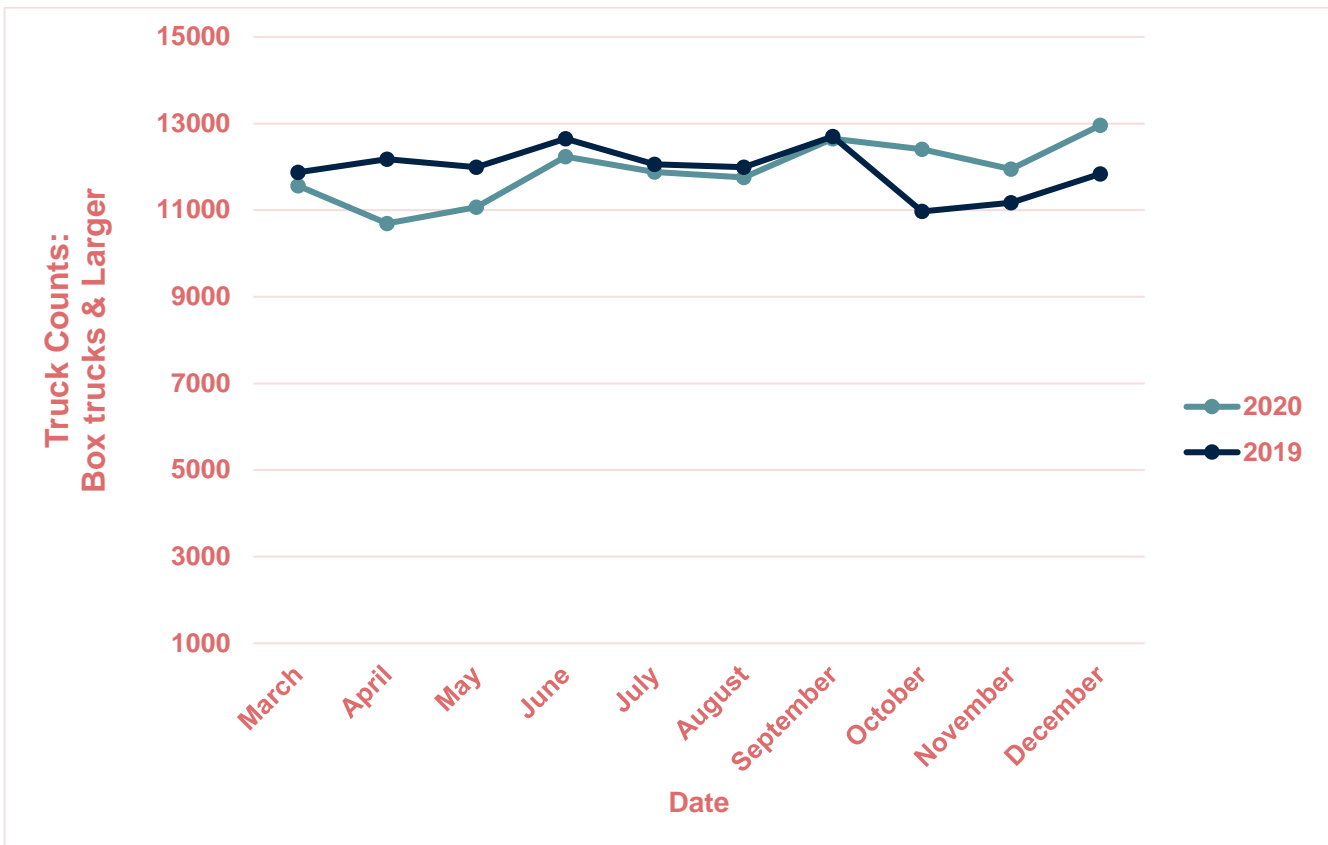
Source: NDOT Traffic Information Systems

Figure 2-3: Monthly Average Daily Traffic 2019 and 2020 at I-15 in Las Vegas



Source: NDOT Traffic Information Systems

Figure 2-4: Monthly Average Daily Truck Traffic 2019 and 2020 at I-15 in Las Vegas



Source: NDOT Traffic Information Systems



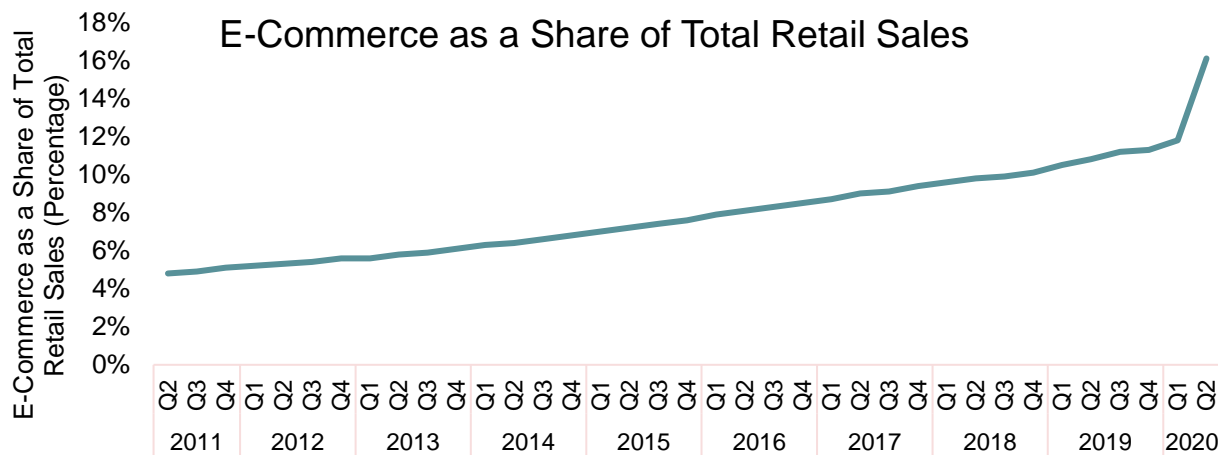
Freight rail volumes in the western U.S. appear to have experienced a similar decline as truck volumes. The two major railroads passing through Nevada are the Union Pacific (UP) and BNSF Railway. Data are not available specifically for Nevada on these railroads. However, weekly rail carloadings for the UP declined from 160,000 per week in May of 2019 to 120,000 in May of 2020, but September 2020 volumes are roughly equivalent to 2019<sup>1</sup>. BNSF had total carloadings, including intermodal traffic, drop 20 percent year-over-year in May of 2020, but showed increases in year-over-year volumes by December of 2020<sup>2</sup>.

The largest air cargo airport in Nevada is the Las Vegas McCarran International Airport. Air cargo volumes at McCarran decreased by 18 percent from April 2019 to April 2020, to a total of 18 million pounds. This gap has only decreased slightly as November 2020 volumes remained 13 percent below 2019 levels.

## 2.2 Impacts of COVID-19 on Freight Infrastructure

COVID-19 also impacted freight origin-destination patterns. This has been most notable for the trucking industry as a result of the dramatic increase in e-commerce sales. As shown in Figure 2-5, after years of consistent growth in e-commerce, these sales experienced approximately 5 years' worth of previous growth between the first two quarters of 2020.

Figure 2-5: U.S. Quarterly E-Commerce Sales as Percent of Total Retail Sales



Source: Federal Reserve Bank of St. Louis

The freight infrastructure needed to support e-commerce sales includes a more dense network of urban fulfillment centers and reverse logistics capabilities that are not as important for standard brick and mortar sales. In Nevada, the industrial real estate community has responded to these anticipated needs by building several warehouses and distribution centers in the Las Vegas region. Nearly 4 million square feet of industrial real estate was completed in the third quarter of 2020 (Figure 2-6) which is significantly more than any other quarter in the past two years. Additionally, many more were scheduled to be completed in the fourth quarter of 2020 and the first two quarters of 2021 (Figure 2-7). Many of the facilities scheduled for completion in the fourth quarter of 2021 are located in the North Las Vegas region which indicates that there could be significant increases in truck traffic in that subregion. Facilities scheduled for completion in 2021 are more evenly

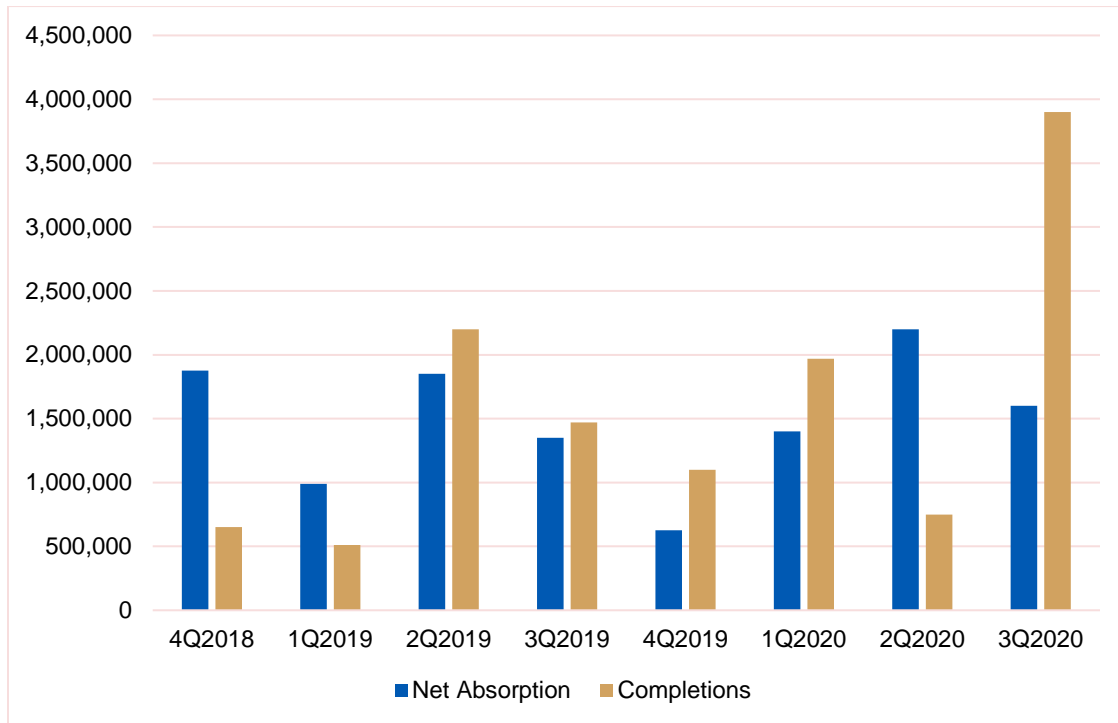
<sup>1</sup> Union Pacific Third Quarter Earnings Release Presentation, October 2020.

<sup>2</sup> BNSF Weekly Carload Reports 2020, <https://www.bnsf.com/about-bnsf/financial-information/weekly-carload-reports/#percent23subtabs-2>

dispersed across Las Vegas submarkets which indicates that there are several locations with the potential to experience increased truck traffic volumes over the next few years as these new facilities are leased to individual companies.

For freight rail and air cargo, there are not significant increases in freight volumes as a result of COVID-19. Therefore, no additional freight infrastructure needs appear to be needed for these modes. Nevertheless, for other types of disruptions, it is possible that demand for these freight modes would increase dramatically. It is important to ensure that redundant network connectivity exists for freight rail such that Nevada can access goods produced in other major markets, including global markets. For freight rail and air cargo, it is important to understand the levels of excess capacity that exist so that maximum surge demand levels are known in advance of any disruptions.

**Figure 2-6: Quarterly Completions and Net Absorption for Industrial Real Estate in Las Vegas Market**



Source: Colliers International 2020 Q3 Industrial Las Vegas Report

Figure 2-7: Las Vegas Industrial Market Schedule as of October 2020

Project	Type	Submarket	Size (sq. ft.)	Pre-Leasing
<b>Q4-2020</b>			<b>2,497,240</b>	<b>20%</b>
Brass Diablo	Light Distribution	Southwest	20,080	65%
Civic Center Commerce Park	Warehouse/Distribution	North Las Vegas	118,021	0%
Durango 215 Point	Flex	Southwest	75,000	0%
Lone Mountain Logistics	Warehouse/Distribution	North Las Vegas	93,943	0%
Marion Logistics Center	Warehouse/Distribution	North Las Vegas	282,220	0%
Marion Logistics Center @ West Cheyenne	Warehouse/Distribution	North Las Vegas	248,106	0%
Marion Logistics Center @ West Cheyenne	Light Distribution	North Las Vegas	479,120	0%
Niagara Bottling BTS	Warehouse/Distribution	North Las Vegas	300,000	100%
North Las Vegas Business park	Warehouse/Distribution	North Las Vegas	297,273	0%
Silver State Commerce Center	Warehouse/Distribution	North Las Vegas	174,615	100%
Stephanie Commerce Center	Warehouse/Distribution	Henderson	338,048	0%
Stephanie Industrial Center	Light Industrial	East Las Vegas	70,814	0%
<b>Q1-2021</b>			<b>1,413,121</b>	<b>37%</b>
4750 West Sunset Road	Warehouse/Distribution	Southwest	42,272	0%
Becknell Blue Diamon ½	Warehouse/Distribution	Southwest	220,160	0%
Beltway Business Park 11/12	Warehouse/Distribution	Southwest	329,775	0%
Diamond Freight Facility	Warehouse/Distribution	Southwest	36,810	0%
Mountain West Industrial Park	Warehouse/Distribution	Southwest	214,100	53%
Paccar Parts Warehouse Addition	Warehouse/Distribution	North Las Vegas	98,612	100%
Post Discovery Spectrum	Light Distribution	Southwest	171,392	7%
Switch	Warehouse/Distribution	Southwest	300,000	100%
<b>Q1-2021</b>			<b>1,001,280</b>	<b>0%</b>
Logisticcenter at Sunset	Warehouse/Distribution	Airport	151,200	0%
South15 Airport Center F/G/H	Warehouse/Distribution	West Henderson	850,080	0%
<b>Q2-2021</b>			<b>1,032,518</b>	<b>0%</b>
Tropical Logistics Park	Warehouse/Distribution	North Las Vegas	1,032,518	0%

Source: Colliers International 2020 Q3 Industrial Las Vegas Report

### 2.3 Impacts of COVID-19 on NDOT Internal Operations

Operational impacts of COVID-19 were identified from interviews with NDOT Operations staff and research on the Nevada Trucking Association.

NDOT developed a COVID-19 response team to better understand and manage the impacts of the pandemic on its internal operations. The response team included public information officers, human resources division head, division directors, and the executive team. The biggest impact of COVID-19 on NDOT’s internal operations was the requirement for most staff to work from home rather than the standard office environment. This presented significant challenges on Information Technology resources to supply laptops to a large number of staff that previously worked on desktops and to allow access to other staff from personal computers in the interim while laptops were procured.

There are some NDOT functions that must be done at DOT facilities such as material testing at NDOT laboratories. These operations remained intact with capacity reduced in these facilities through staff working split shifts and alternating days in the laboratory to facilitate reduced capacity requirements.

There were also some impacts in regards to how maintenance and asset management functions operated. Field crews were required to socially distance which included driving individual vehicles to field locations rather than carpooling. This caused some disruption in the short term (e.g. delays in collection of trash and roadway damage) which was resolved by accessing the broader pool of fleet vehicles that are operated at other Nevada state agencies to meet this new internal demand for fleet vehicles at NDOT. Additionally, a fleet of vehicles that were leased and due to be returned to the lessee were extended for an additional six months which added to the pool of vehicles available to NDOT staff.



Additionally, there were some limitations on supplies such as concrete and steel experienced by contractors which resulted in time extensions for the completion of some construction projects. The supply constraints were resolved by expanding the supplier base used by contractors and these time extensions have been reduced to normal levels.

The largest impact on trucking operations was the closure of several restaurants that were frequently used by long-haul truck drivers. This caused trucks to utilize fast food restaurant locations that were not built for operations of large vehicles which increases pavement damage and has the potential to be unsafe for other roadway users and pedestrians. The operation of food trucks at rest areas were considered as a possible solution to the shortage of food options. However, by the time approval was granted for this option, many of the pre-existing restaurants were allowed to operate at 50 percent capacity, so demand for food trucks decreased.

NDOT fuel tax revenue decreased due to the reduction in vehicle miles traveled. The response to this fuel tax reduction was to utilize reserve funds to continue some projects, while other projects were delayed or eliminated. Now that vehicle miles traveled is approaching 2019 levels, the revenue shortfalls are minimal. However, this process reinforced the importance of maintaining a reserve fund at NDOT.

The need to make important decisions early on in the COVID-19 process highlighted the need to get accurate information on traffic flows and roadway performance along with the need to disseminate information to the driving public – for both passenger cars and trucks. NDOT is in the process of implementing many more active traffic management systems equipment, primarily dynamic message signs, throughout the state. This would be enhanced if it were coupled with more real-time traffic tracking information.

### 3 COVID-19 AND UNPLANNED EMERGENCIES' AND RESILIENCY

COVID-19 presents several challenges to consider for the resiliency of Nevada's freight infrastructure and internal NDOT operations. However, it is just one of many unplanned emergencies posing potential disruptions that could impact system resiliency.

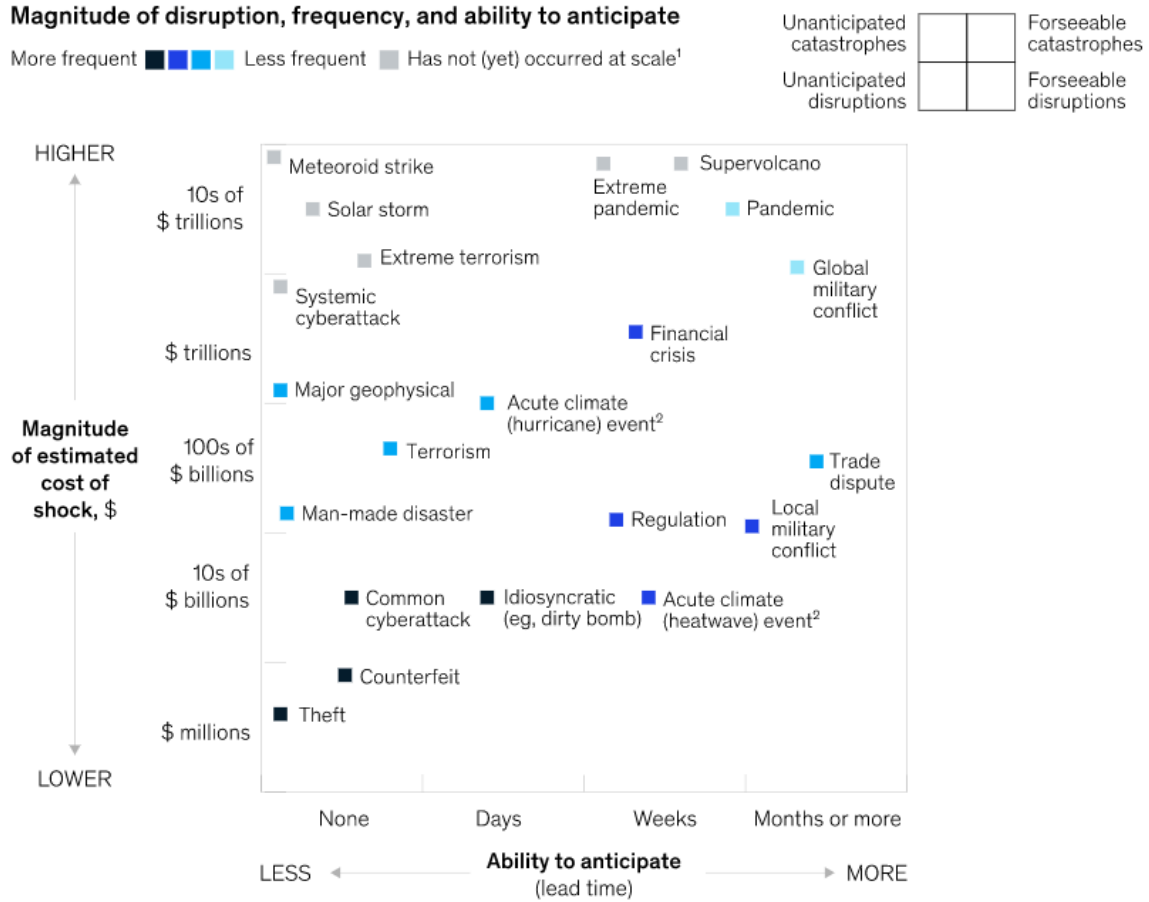
Figure 3-1 displays a more comprehensive range of potential disruptions that can be used to think systematically about resiliency. It demonstrates that these disruptions can be thought about across three dimensions:

- 1) the magnitude of the shock to the system, in this case measured by the cost impact of the shock,
- 2) the ability to anticipate the disruption, and
- 3) the frequency of the disruption.

A pandemic such as COVID-19 fits into the category of disruptions that are relatively easier to anticipate because it starts out as very small and stays at a low level for weeks or months prior to having a significant impact on society. However, the costs have the potential to be very high as evidenced by the trillions of dollars of economic impact caused by COVID-19.

The appropriate NDOT response to disruptions with different loss magnitude, predictability, and frequency will be quite different from the response for COVID-19. While responses to some of these disruptions have already been built in to NDOT operations (e.g. acute climate event related to winter weather), there are several others which have not yet been fully considered. A comprehensive resiliency plan for NDOT has the ability to cover a broad set of disruptions and develop strategies that describe the financial, operational, training, and interagency communication and coordination requirements to significantly strengthen resiliency at the agency level.

Figure 3-1: Matrix of Potential Disruptions



Source: McKinsey Global Institute, Risk Resiliency and Balancing Global Value Chains, August 2020.

## 4 RECOMMENDATIONS

There are several high-level recommendations to consider as part of this review of COVID-19 and freight resiliency as follows:

- Continue to track changes in truck and overall traffic volumes from COVID-19 on major interstates and local roads to better determine the full traffic impacts from the pandemic.
- Empower NDOT and other state agencies to implement temporary emergency response decisions more quickly to match with real-time conditions in the field during emergency declarations. This will allow NDOT to more quickly permit actions such as the use of food trucks at rest areas, when restaurants are closed.
- Develop a full set of lessons learned from NDOT's COVID-19 response team that includes insights on interagency coordination and communication protocols that will be needed to match other future disruptions.
- Develop real-time (or near real-time) traffic monitoring capabilities with capabilities to inform decision makers about the impacts of disruptions on specific/critical freight-dependent corridors and segments (e.g. I-15, I-80, I-11, US-95, US-93 and US-50) and the system as a whole.
- Determine impacts of changes in truck travel patterns due to COVID-19 on local communities in the Las Vegas and Reno/Sparks regions, including the capabilities to handle more truck traffic on connecting roads between industrial areas and state highways. Additionally, determine any impacts from changes in rail traffic on local communities, particularly for at-grade rail crossings.
- Improve modal options for the movement of goods to reduce reliance on highways during times of disruption, especially intermodal rail traffic between northern Nevada and the Port of Oakland.
- Develop a statewide resiliency plan that includes strategies for emergency preparedness across a broad set of disruption categories. This plan should involve a wide range of state, local, and federal agencies, so that responses to disruptions will incorporate the needs and capabilities of all relevant stakeholders.