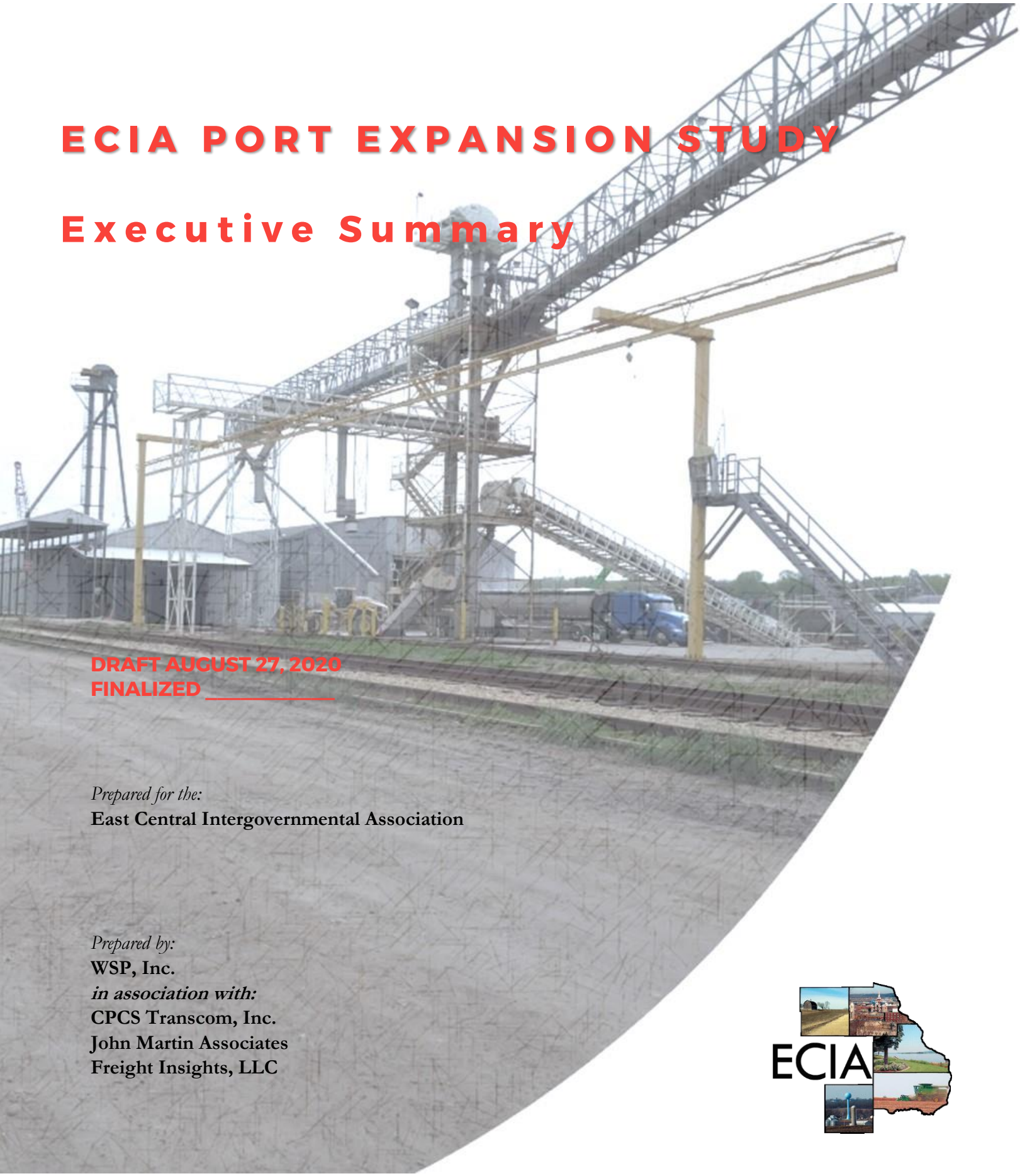
ECIA PORT EXPANSION STUDY

Executive Summary



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FINALIZED _____

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East Central Intergovernmental Association

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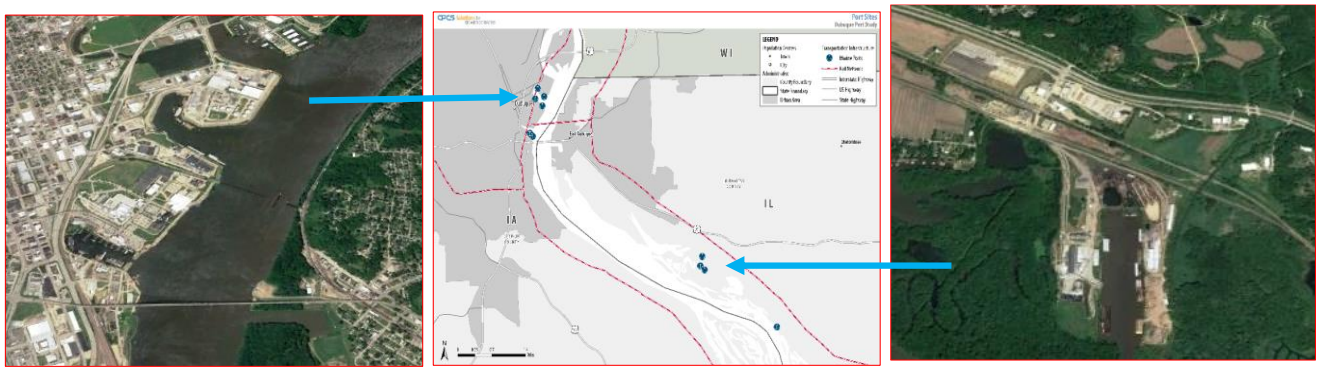
About the ECIA Port Expansion Study

The East Central Intergovernmental Association (ECIA), in partnership with the states of Illinois and Iowa, local and regional governments, and local marine terminal operators, conducted a study of the potential to expand and enhance the physical and operational capabilities of marine freight terminals in Dubuque, IA and East Dubuque, IL. The ECIA Port Expansion Study was designed to:

- Provide more multi-modal transportation options for regional shippers to connect them to the international and domestic transportation system and associated worldwide markets;
- Serve as a catalyst for economic development in Iowa, Illinois and the local region;
- Evaluate potential market demand for freight to move via the Mississippi River from existing port facilities;
- Document the primary characteristics required for a successful and sustainable operation, including business logistics, transportation access, infrastructure and other factors;
- Identify port expansion opportunities to capture demand, generate economic benefits and achieve the overall goals of the study and its stakeholders;
- Position improvement projects for grant funding through Benefit-Cost Analysis; and
- Provide input for regional and local plans by the Dubuque Metropolitan Area Transportation Study (DMATS), ECIA and others.

The study addressed the Gavilon Terminal located in Dubuque IA, the Logistics Park Dubuque terminal located in East Dubuque IL, highway and rail access systems serving these facilities, customer markets currently or potentially attracted to these facilities, inland rail hubs in Iowa and Illinois, and competing marine terminals on the Mississippi and Illinois River systems.

Figure 1: Focus Areas for ECIA Port Expansion Study



Gavilon / Port of Dubuque

Logistics Park Dubuque

The study was conducted over a 14-month period and consists of eight primary task areas.

- Task 1. Stakeholder Engagement. Objective: Establish and implement a program for two-way communication among and between study managers, stakeholders, and the consultant team, to best inform the study process and support consensus findings.

- Task 2a. Data Collection/Inventory. Objectives: Identify the most "mission critical" information for the region's port assets, highway and rail infrastructure, regional land use and industry locations.

- Task 3. Market Analysis. Objective: Document the primary characteristics and components of current market demand by water and the growth potential for commodities that could be served by study area ports in the future.

- Task 4. Capacity Analysis and Program Level Recommendations. Objective: Match available port, access and service capacity to potential demand, to identify shortfalls which represent opportunities for improved port facilities and services in the year 2025 and 2040 timeframes.

- Task 5. Needs Assessment by Port Location. Objective: Develop location-specific port improvement recommendations.

- Task 6. Study Recommendations. Objective: Evaluate the benefits and costs of the proposed port location-level improvement programs.

- Task 7. Final Report and Documentation. Objectives: Produce Final Report including Executive Summary and Technical Appendices; produce stand-alone Executive Summary; produce confidential Market Plan for each port area.

Stakeholder Engagement

The study was directed by a Technical Committee consisting of representatives from: ECIA; State of Iowa; State of Illinois; City of Dubuque IA; City of East Dubuque IL; Greater Dubuque Partnership; Blackhawk Hills Regional Council; Northwest Illinois Economic Development Corporation; Newt Marine; Logistics Park Dubuque/Alliant Energy; and Gavilon LLC. Over the duration of the study, six Technical Committee meetings were conducted, along with two briefings of the Dubuque Area Metropolitan Transportation Study (DMATS) Board.

The initial stakeholder outreach included interviews with 20 individuals/organizations with important perspectives and information relevant to the study (see Table 1). These interviews addressed both public and private sector perspectives and provided many additional contacts. More than 40 additional interviews were subsequently conducted with freight transportation customers, carriers, and facility operators to inform the Market Analysis.

Table 1: List of Organizations Interviewed for Initial Outreach

Adkins Energy	Grant County (WI) EDC
Atten Babler	Greater Freeport Partnership
Blackhawk Hills Regional Council	Illinois Soybean Association
City of Dubuque	Jo Carroll County
City of East Dubuque	Logistics Park Dubuque
City of Prairie DuChien	Newt Marine
City of Rochelle	Northwest Illinois Economic Development
Department of Fish and Wildlife	(Private Developer)
Dubuque Economic Development	Savanna Local Redevelopment Authority
Gavilon	USACE Rock Island

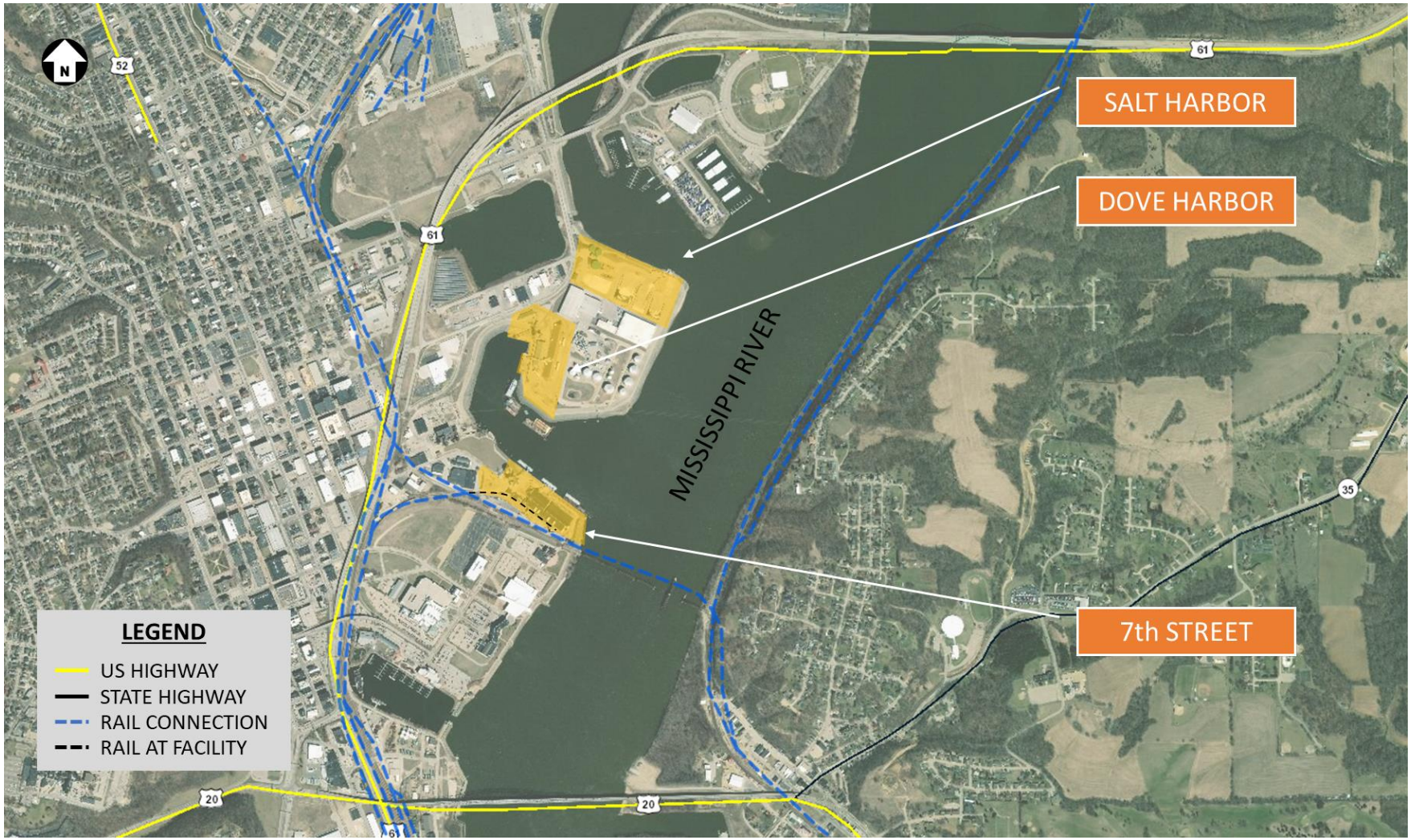
Data Collection

GAVILON TERMINAL

Gavilon's facility is located at Port of Dubuque in Dubuque, IA and is divided into three separate operating areas -- Salt Harbor (12.3 acres), Dove Harbor, 12.7 acres) and Seventh Street 13.0 acres), for a total operating area of around 38 acres. Each operating area is leased from the City of Dubuque, which owns the underlying property; Gavilon owns the fixed and mobile assets (structures, cargo handling equipment, etc.) on the operating areas.

Gavilon provides transfer to and from barges on the Upper Mississippi River, with connections to all points reachable by barge. The facilities are connected to US 20, US 52 and US 61 via Kerper Blvd. US 20 provides East-West connectivity. Similarly, US 52 and US 61 provides North-South connectivity to the terminal. The Seventh Street facility is served by Canadian National (CN) Class I railroad with a direct move to the south, and an indirect move to the north. Figure 2 following shows the location and connectivity for Gavilon Terminal.

Figure 2: Gavilon Terminal Location and Connectivity



Source: Google Earth and WSP

Gavilon handles the following commodities at their terminal: grains (primarily corn and soybeans); fertilizers (in both dry and liquid forms); steel reinforcing bars (or "rebars"); steel coils; and de-icing salt. These commodities are either export or imports, and are highly seasonal depending on crop harvesting, weather condition, and river access. Table 2 following summarizes the transportation connections and operating areas associated with these commodities.

Table 2: Gavilon Commodity Transport Characteristics

Commodity	Import Mode(s)	Export Mode(s)	Operating Area(s)
Grain (Corn & Soybean)	Truck/Rail	Barge	7th Street, Dove Harbor
Fertilizer (Dry)	Barge	Truck/Rail	7th Street, Dove Harbor
Fertilizer (Liquid)	Barge	Truck	Salt Harbor
Steel Rebar	Barge	Truck	7th Street, Dove Harbor
Deicing Salt	Barge	Truck	Salt Harbor

The primary activities at each operating area are as follows:

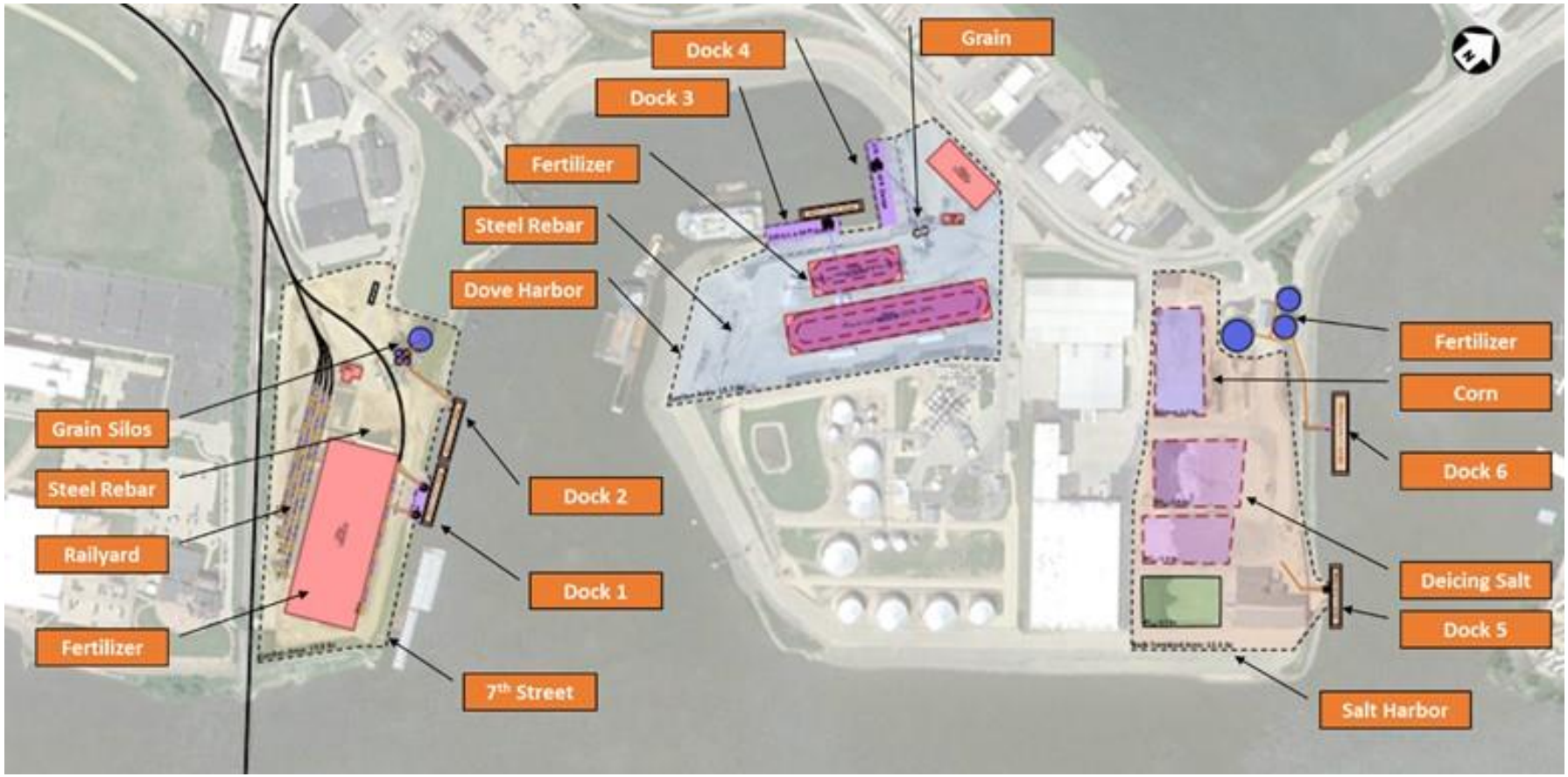
- Gavilon's 7th Street location handles grains, fertilizers and steel rebars. It is the only location that has access to rail service. The rail yard can handle 42 railcars. There are two docks at this facility. Dock 1 handles fertilizer and steel rebars, and Dock 2 handles grains. Fertilizer is stored in warehouses, grain is stored in silos, and steel rebars are stored in any available open space. This facility covers about 13 acres.

- Gavilon's Dove Harbor facility handles grains, fertilizers and steel rebars. There is rail infrastructure available at Dove Harbor, however, CN rail does not provide service to this facility due to lack of cargo. There are two docks at this facility. Dock 3 handles fertilizer and steel rebars, and Dock 4 handles grains. Similar to 7th Street facility, fertilizer is stored in warehouses, grain is stored in silos, and steel rebars are stored in any available open space. This facility covers about 12.7 acres.

- Gavilon's Salt Harbor facility handles, de-icing salt, dried corn, and liquid fertilizer. There is no rail service available. There are two docks at this facility. Dock 5 handles de-icing salt and corn, and Dock 6 handles liquid fertilizers. De-icing salt and corn are stored in open pads, whereas, liquid fertilizer is stored in three storage tanks. This facility covers about 12.3 acres.

Figure 3 following shows the location of various commodity storage and docks at all three facilities for Gavilon.

Figure 3: Gavilon Facilites



Source: Gavilon and WSP. Note: during the course of the study, Gavilon's leasehold boundaries were adjusted, slightly reducing the area at Seventh Street,

The primary commodity movements are as follows:

- Grains are exported out from this terminal where they arrive via truck or rail at the terminal and are loaded on to the barge. About 65% grain arrive via truck and 35% by rail. Rail is primarily used for soybeans. Grains are handled at Dock 2 of 7th Street facility and Dock 4 of Dove Harbor. Grains arriving by truck or railcars are dumped in the loading pit and loaded into the silos. If needed, grains are dried in the dryer. It is then loaded into the barges via barge loader. Grain is mainly handled between the months of March and November. During the winter months, there is no loading and unloading of barges as the river freezes and barge navigation is not possible.

- Dry fertilizer is imported via barges and loaded onto trucks and railcars to be transported out from the terminal. Fertilizer is handled at Dock 1 of 7th Street facility and Dock 3 of Dove Harbor. Fertilizer arrives at the terminal via barges which is unloaded into the hopper by an excavator. It is then transferred to the storage warehouse via conveyer. Fertilizer is then loaded onto a truck or on railcars to be transported out of the terminal.

- Steel rebar is imported via barges and loaded onto truck by forklifts. Steel rebar is handled at Dock 1 of 7th Street facility and Dock 3 of Dove Harbor. Steel rebar are unloaded from the barge and stored in available empty space around the terminal. These rebars are then loaded onto flatbed trucks by forklifts to be transported out of the terminal.

- De-icing salt arrives at the terminal via barge. The salt is unloaded using an excavator and dropped into a hopper. The hopper is connected to mobile conveyers, which transport the salt to their stockpiles behind the berth. De-icing salt is handled at Dock 5 of Salt Harbor. The salt primarily arrives in summer months and stays on the terminal till start of winter season, when it is transported to various cities and counties.

LOGISTICS PARK DUBUQUE

Logistics Park Dubuque (LPD) is located at East Dubuque, IL. LPD was formerly known as IEI Barge Services. LPD is situated about 4 miles downriver from the Gavilon facility. LPD is a single contiguous operating area of approximately 90 acres. LPD's parent company, Alliant Energy, owns the underlying property as well as the fixed and mobile assets (structures, cargo handling equipment, etc.).

LPD provides transfer to and from barges on the Upper Mississippi River, with connections to all points reachable by barge. The facility is connected to US 20 via Barge Terminal Road. US 20 provides East-West connectivity. The facility is served by Canadian National (CN) Class I railroad and has space for approximately 185 railcar spots. There is also BNSF main line passing near the terminal. Figure 4 following shows the location and connectivity for LPD Terminal.

Figure 4: LPD Terminal Connectivity

Source: Google Earth and WSP

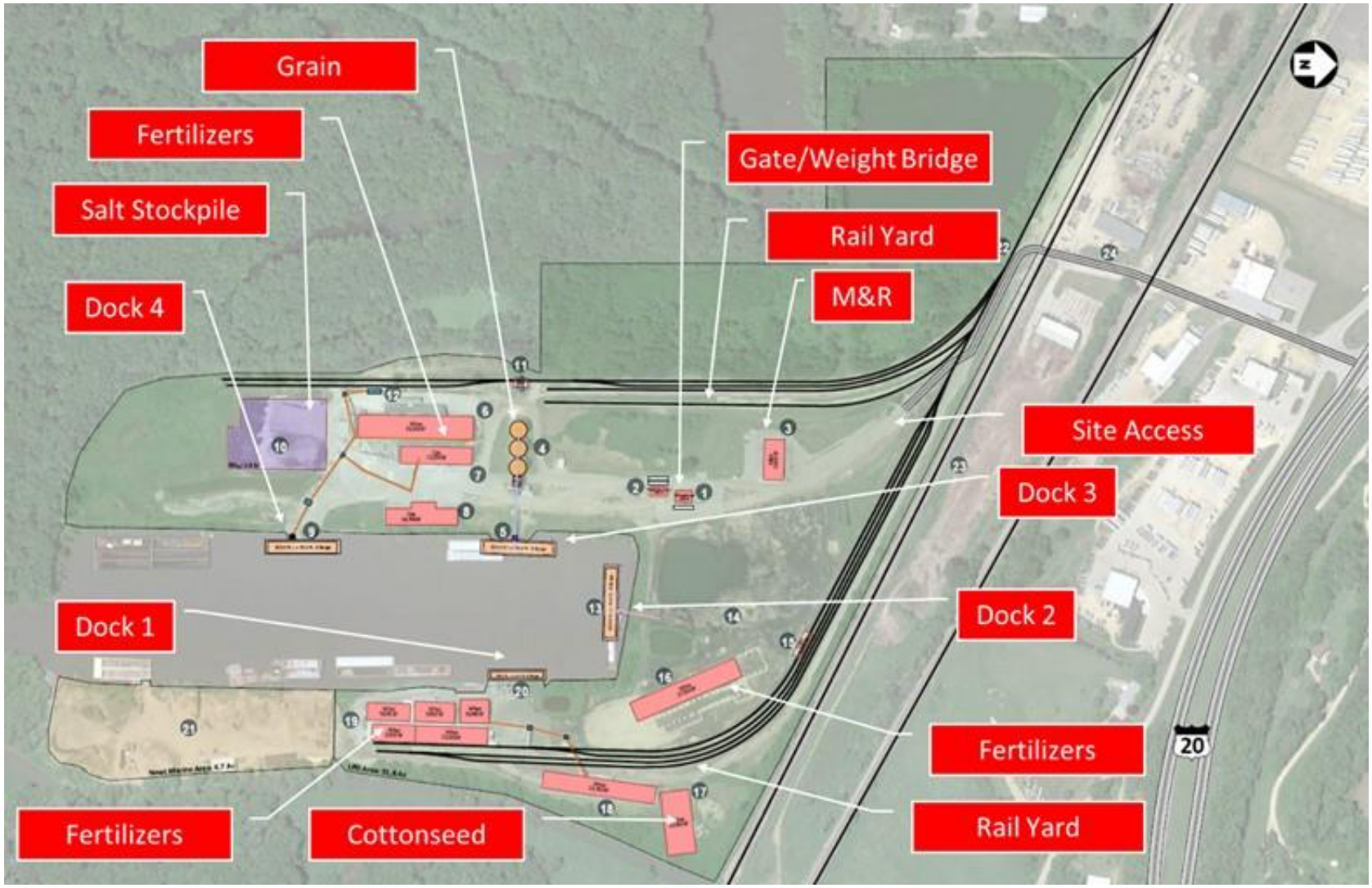
LPD handles the following commodities: grains (corn and soybeans); fertilizers (dry only); cottonseed; and de-icing salt. These commodities are either export or imports, and are highly seasonal depending on crop harvesting, weather condition, and river access. Table 3 following summarizes the transport characteristics of these commodities.

Table 3: LPD Commodity Transport Characteristics

Commodity	Import Mode	Export Mode	Terminal
Grain (Corn & Soybean)	Truck/Rail	Barge	Dock 3
Fertilizer (Dry)	Barge/Rail	Truck/Rail	Dock 1 and 4
Cottonseed	Barge	Truck	Doc 1
Deicing Salt	Barge	Truck	Dock 4

The LPD facility covers about 90 acres. There are four docks at the terminal. Dock 1 handles fertilizers and cottonseed. Dock 2 is currently not used. It was used as coal dock until 2015. Dock 3 handles grains, and Dock 4 handles fertilizers and de-icing salt. Figure 5 following shows the facility map for LPD.

Figure 5: LPD Facilites



Source: LPD and WSP

The primary commodity movements are as follows:

- Grains are exported out from this terminal where they arrive via truck at the terminal and are loaded on to the barge. Grains are handled at Dock 3 of the terminal. Grains arriving by truck are dumped in the loading pit and loaded into the silos. The grain silos have a capacity of 300,000 bushels (three silos with 100,000 bushels capacity each). It is then loaded into the barges via barge loader. Grain is mainly handled between the months of March and November. During the winter months, there is no loading and unloading of barges as the river freezes and barge navigation is not possible.

- Dry fertilizer is imported via barges or rail and loaded onto trucks to be transported out from the terminal. The modal split for fertilizer import is about 60% by barge and 40% by railcars. Fertilizer is handled at Dock 1 and 4 the facility. Fertilizer arrives at the terminal via barges which is unloaded into the hopper by an excavator. Fertilizer that arrives via rail goes straight into the hopper and is transferred to the storage warehouse via conveyor. Fertilizer is then loaded onto a truck to be transported out of the terminal.

- Cottonseed arrives inbound primarily via barge and is shipped out via truck. Cottonseed is handled at Dock 1 of the facility and stored in warehouse.

- De-icing salt arrives at the terminal via barge. The salt is unloaded using an excavator and dropped into a hopper. The hopper is connected to mobile conveyers, which transport the salt to their stockpiles behind the berth. De-icing salt is handled at Dock 4 of the facility. LPD has storage for about 70,000 tons of salt at their facility. The salt primarily arrives in summer months and stays on the terminal till start of winter season, when it is transported to various cities and counties.

WATER CONDITIONS

The Upper Mississippi is roughly 1300 miles in length from Northern Minnesota to its confluence with the Ohio River. About 850 miles, as far north as Minneapolis-St. Paul, is navigable because of a system of 29 lock and dam structures, managed by the US Army Corps of Engineers, providing a “stairway of water” between higher and lower land elevations (799 feet to 398 feet above sea level). The Gavilon and LPD facilities are located between Lock and Dam 11 (Dubuque) and 12 (Bellevue). Each dam creates a pool of water behind it at a certain elevation, and lock structures (which function essentially like elevators) at each dam are used to transfer vessels between the different water elevations. Through a combination of maintenance dredging and water management, nine-foot navigation depths and a minimum 300-foot wide channel are maintained over the Upper Mississippi.

Based on review of public data and on interviews with terminal operators, the US Army Corps of Engineers, and the US Department of Fish and Wildlife, water depths and operating conditions at the LPD and Gavilon sites are considered adequate and appropriate for marine cargo activities within current operating areas. However, the Department of Fish and Wildlife cautioned that in the future,

introducing operations such as cargo storage, cargo transfer or barge fleeting within protected areas not currently used for those activities would trigger an involved review and permitting process. This guidance informed the development of study recommendations.

Sections of the Upper Mississippi are closed to navigation each winter due to ice and/or for winter maintenance. Outside of winter months, the Corps periodically closes sections of the inland waterway system for significant repairs and maintenance activities. The Corps reports that critical maintenance on the Upper Mississippi Lock and Dam system has progressed well, and the overall reliability of the built infrastructure has improved significantly as a result. Unfortunately, the reliability of the river system as a whole was significantly worse in 2019 due to extended high-water closures – excessive rainfall raised water levels to the point where flooding occurred, and navigation was not possible over much of the system. Flood events are cyclic, but if they become more severe and/or more frequent, waterborne commerce will be further impacted.

Market Analysis

COMPETING FACILITIES

Based on feedback from study stakeholders, the 'competitive distance' for most commodities is generally between 50 and 75 miles from the study area terminals. Lower-value, higher-volume goods such as grains or raw chemicals are often not economically feasible to ship by truck for longer distances, as trucking's cost per ton-mile is relatively higher compared to barge and rail service. Shipping these low-value, high volume commodities by truck can make up a large portion of the cost to the end-user and eat into relatively thin profit margins. Additionally, both Illinois and Iowa have extensive intermodal service in the form of grain elevators and other terminals, which limits a barge terminal's ability to capture traffic from further inland. Higher-value or specialized cargo may be willing to move longer distances to access required handling capabilities.

Competing facilities and locations nearby include Consolidated Grain and Barge (Savana IL) and Bunge Grain (Dubuque IA), who compete for grain business. Outside the immediate study area, major competitors include:

- Ports at LaCrosse WI and Clinton IA. These facilities can compete strongly for waterborne freight throughout a substantial portion of the Dubuque/East Dubuque market area. ADM is currently planning to invest $196 million at Clinton to update machinery and expand the facility, supporting the production of a variety of corn products including sweeteners, beverage alcohol, ethanol, and animal feed, potentially making it an even stronger attractor for regional freight.

- ADM Cedar Rapids (corn processing, dry corn milling for ethanol). Although ADM Cedar Rapids is not served by water – it is a truck and rail facility – it competes directly for freight that could otherwise move via water through the study area ports. In 2019, ADM announced plans to spin off the ethanol production facility as a subsidiary, possibly due to business pressures.

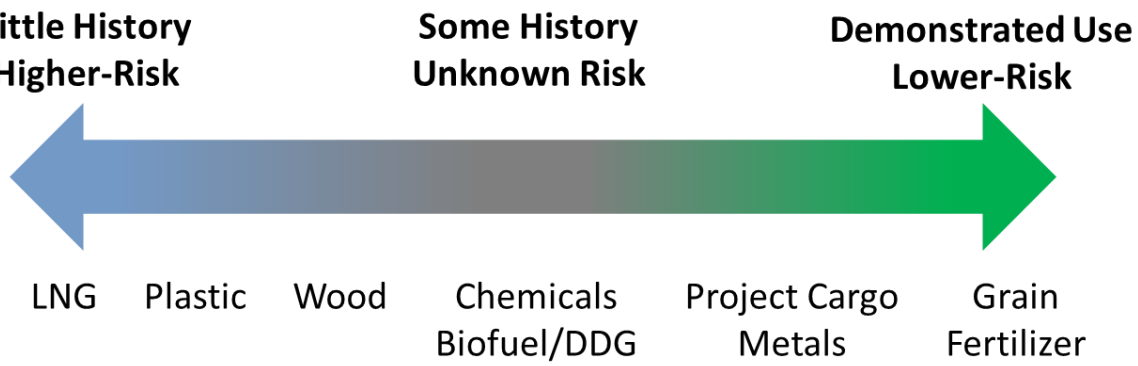
- Other port facilities including Quad Cities IA/IL, Minneapolis-St. Paul MN, and St. Louis MO are competitive for certain products that are, or could be, handled through Gavilon and Logistics Park Dubuque.

COMMODITY ATTRACTION AND COMPETITIVENESS

The study performed a synthesis analysis of current facility operations, market demand, and competitive position. Competitive opportunities for each commodity were ranked based on the number and location of competitor terminals, the consumption or demand for materials in the market area, and the previous history of materials' movement on the Mississippi River, as shown in Figure 6. Commodities with little to no history of movement on the Mississippi River are shown on the left and are considered more speculative or "higher risk" for potential barge service. In comparison, commodities regularly moved on the Mississippi River are shown on the right and are considered "lower risk" due to their demonstrated history of shipment on the River.

In general, bulk materials related to agriculture and heavy manufacturing (such as grain, fertilizer, and metals) already move on the river, and therefore are considered low-risk commodities to attract to a terminal. Chemicals, biofuels (such as ethanol), and dry distiller grains (DDG) are reasonable opportunities. Lighter, higher-value manufacturing inputs such as wood and plastic do not move on the river right now, and along with Liquid Natural Gas (LNG) represent less competitive commodities.

Figure 6. Spectrum of Commodity Competitiveness



DEMAND FORECAST

A detailed market analysis was developed (see Table 4) to estimate the commodity types and volumes that could potentially and realistically be served by Gavilon and Logistics Park Dubuque at a detailed quantitative level. The forecasts are "unconstrained" in that they show the amount of freight that would logically prefer to use ECIA region ports compared to competing facilities, assuming sufficient capacity and handling capability is available at ECIA ports. In cases where there is a wide variation between low and high forecasts, this reflects cases where there is upside potential but also significant uncertainty; in cases where there is a low variation, this indicates a high degree of confidence.

Table 4. Summary of ECIA Region Port Commodity Market Forecast (in Tons)

	Current (2019)	Low Forecast (2045)	High Forecast (2045)
Soybeans	704,472	912,471	1,178,876
Fertilizer	644,542	1,078,588	1,400,096
Salt	564,542	564,542	564,542
Corn	439,097	568,744	767,854
Steel	37,500	55,464	69,199
Corn Meal	21,526	27,882	27,882
Dry Distillers Grains	21,114	35,333	650,299
Cotton	18,642	18,642	18,642
Soybean Meal	0	0	196,088
Resins	0	0	68.672
Lumber	0	0	9,429

Capacity Analysis and Program Guidance

Detailed modeling was performed to estimate the capacity of the region's port facilities by looking at the various components of cargo throughput – berths, loading/unloading equipment, open and covered storage, truck transfer, and rail transfer – individually and as they are linked to accomplish multi-modal movement of cargo.

The capacity estimates are expressed as "Maximum Practical Capacity" or MPC. MPC is the throughput level a terminal can handle at a sustained rate under normal operating practices (work schedules, equipment deployment, number of employees, etc.). Compared to container terminals, which operate consistently over the entire year, river port operations can be highly variable over a year based on scheduled or unscheduled river closures, shifts of water traffic to rail when necessary, and use of facilities for different commodities at different times of the year. Seasonal changes in demand and in the use of terminal assets were considered in the analysis.

Table 5 and Table 6 following present the results of the capacity analysis. Note that capacities are provided separately for berth and storage functions; the lower of the two figures is the "bottleneck" that establishes the MPC.

Table 5. Logistics Park Dubuque Berth and Storage Capacity Estimates

Dock	Cargo	Unit	MPC Throughput Capacities	
			Berth	Storage
Dock 1	Fertilizer	Tons/Year	400,000	281,000
Dock 1	Cottonseed	Tons/Year	100,000	229,000
Dock 2	not in use			
Dock 3	Grain	Bushels/ Yr.	17,857,000	13,750,000
Dock 4	Fertilizer	Tons/Year	840,000	115,000
Dock 4	Salt	Tons/Year	560,000	71,000

Table 6. Gavilon Berth and Storage Capacity Estimates

Dock	Cargo	Unit	Throughput Capacities	
			Berth	Storage Yard
Dock 1	Fertilizer	Tons/Year	485,000	285,000
Dock 1	Steel Rebar	Tons/Year	62,550	4,000
Dock 2	Grain	Bushels/Year	21,473,000	14,927,000
Dock 3	Fertilizer	Tons/Year	625,500	218,000
Dock 3	Steel Rebar	Tons/Year	104,250	18,000
Dock 4	Grain	Bushels/Year	11,170,000	4,535,000
Dock 5	Salt	Tons/Year	293,250	85,000
Dock 5	Dry Corn	Bushels/Year	6,982,000	7,488,000
Dock 6	Fertilizer	Tons/Year	488,750	104,000

Next, region-wide program recommendations were developed based on the following considerations:

- **Future shortfalls in capacity compared to demand**. Based on existing capacity and projected demand, Gavilon and LPD combined will reach their maximum capacity for fertilizers in 2030 and are essentially at capacity for salt and steel today. Without improvements, by 2045 these ports will be able to handle only 71% of fertilizer demand, 27% of salt demand, and 32% of steel demand for the region. Berth capacity is adequate – the constraint is storage, and just over 400,000 square feet of additional storage would be required to fully capture demand. Other commodities such as grain, corn and cottonseed are not projected to experience shortfalls. See Table 7 following.
- **Imminent loss of existing capacity to handle critical commodities.** Today, both Gavilon and Logistics Park Dubuque face the prospect of losing existing fertilizer capacity in antiquated buildings that need replacement. Instead of running out of fertilizer capacity by 2030 as shown

in Table 7, the region would face an immediate shortfall of fertilizer capacity. Additionally, Logistics Park Dubuque faces the potential loss of salt handling capacity, as state regulatory pressures lead to the elimination of open storage piles for salt. The region's ports are already at capacity for salt, so the loss of LPD capacity would create an immediate deficit.

- **"Opportunity commodities" from the market analysis.** Among the many new commodity market opportunities considered in the study market analysis, probably the most achievable and attractive is agricultural by-products (dried distiller grain, soybean meal, corn gluten meal and pellets). There are known regional shippers who are using more distant ports because of a lack of facilities in the ECIA region, and these would be likely candidates to anchor this business at local ports.
- **Access improvement opportunities.** There are significant existing rail access deficiencies at Gavilon, significant highway access issues at Logistics Park Dubuque, and opportunities for improvements to highway and rail at both ports to meet trip generation needs.

Table 7. Long-Range Capacity Shortfalls

Commodity	Year Capacity Reached	% of Needed 2045 Capacity Available Now	Additional Storage Needed
Fertilizers	2030	71%	25,400 SF
Salt	2020	27%	227,000 SF
Steel	2020	32%	160,000 SF

This suggested the following programmatic development direction:

- **Near-term**: ensure the preservation of existing fertilizer and salt-handling capacity; work to capture identified opportunities in agricultural by-products; and remedy the most pressing regional rail deficiencies. Section 4 lays out a specific development plan and program to accomplish this.
- **Long-term:** look to substantially expand capacity for fertilizer, salt, steel, and other market opportunities; address highway access to Logistics Park Dubuque; and leverage planned roadway improvement adjacent to Gavilon to support future terminal expansion.

Two potential types of near-term projects were specifically considered and not advanced – container on barge service and intermodal truck/rail transfer. The market feasibility and identifiable demand for these services in the ECIA region is small; the required facilities would be expensive to develop and would displace active customers, proven markets, and realistic future opportunities; and ECIA region facilities are not projected to be cost-competitive with other transportation options.

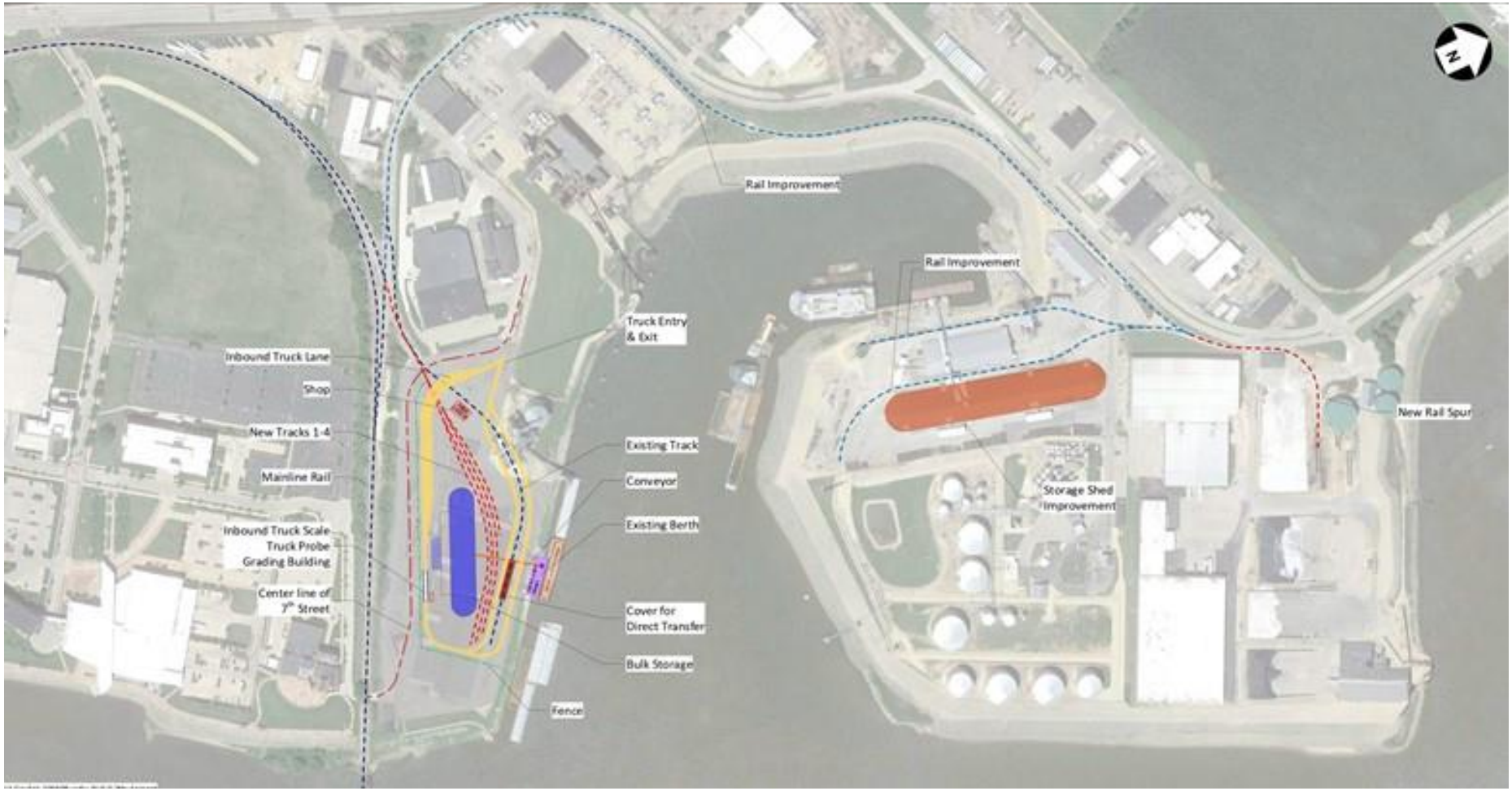
Near-Term Needs and Recommendations

The strengths and weaknesses of each port location (including marine infrastructure, water depth and navigability, highway and rail access and other relevant factors) were reviewed in combination with the market forecasts and development program to develop a list of near-term needs and project recommendations. The study team worked directly with Gavilon and Logistics Park Dubuque to develop an area-wide improvement program and corresponding projects at each port facility, and created plans and layout diagrams for improvements to marine terminals (addressing salt, fertilizer, and agricultural by-products handling) along with rail access improvements. These projects were included in two discretionary grant applications submitted by ECIA under the BUILD 2020 and PIDP 2020 programs.

GAVILON PROJECTS (2020-2025)

- *Replace an older fertilizer storage building with a 20,000-ton capacity shed* – Gavilon is a leading wholesaler of bulk blending fertilizers. Through its seventy-five bulk terminals located on the Mississippi River and in key agriculture growing areas, Gavilon provides crop nutrients to agricultural retailers across the region. A fertilizer storage structure at the 7th Street site in Dubuque is at the end of its useable life. Gavilon would replace this fertilizer warehouse with a 20,000-ton capacity building to enable ongoing operations at the facility.
- *Renovate an existing fertilizer storage shed to increase its capacity by 12,000 tons* – Before wholesale purchase, dry fertilizer is stored at the Dove Harbor site. A fertilizer storage warehouse at Dove Harbor would be expanded by 12,000 tons to accommodate more product on site. This increased capacity will enable Gavilon to handle more commodity shipments.
- *Replace/upgrade inoperable rail track* – The CN railroad connects directly with the Gavilon facility. However, a portion of rail track at the Dove Harbor site is inoperable in its current condition. Replacing and upgrading this track will enable rail service that has been curtailed at the Dove Harbor site, providing multimodal shipment of grain, fertilizer, and steel rebar. CN has provided a letter of support for the project and is working with study partners on design and operating details.
- *Relocate rail track to support direct transfer/transloading of fertilizer and other bulk products from river barge to rail* – Rail track at the 7th Street site will be relocated to accommodate a smaller footprint and maintain the current business structure. This improvement will aid Gavilon in moving product more efficiently from barge to rail.
- *Install new rail equipment, including main line switch, loadout system, and shed* – New rail equipment at the Dove Harbor site is necessary to repair and utilize existing rail infrastructure and expand Gavilon's multimodal transportation capabilities at the port. The project will support a main line switch from the CN track, a loadout system to enable the loading of fertilizer into rail cars, and a new shed to cover the loadout and reduce emissions.

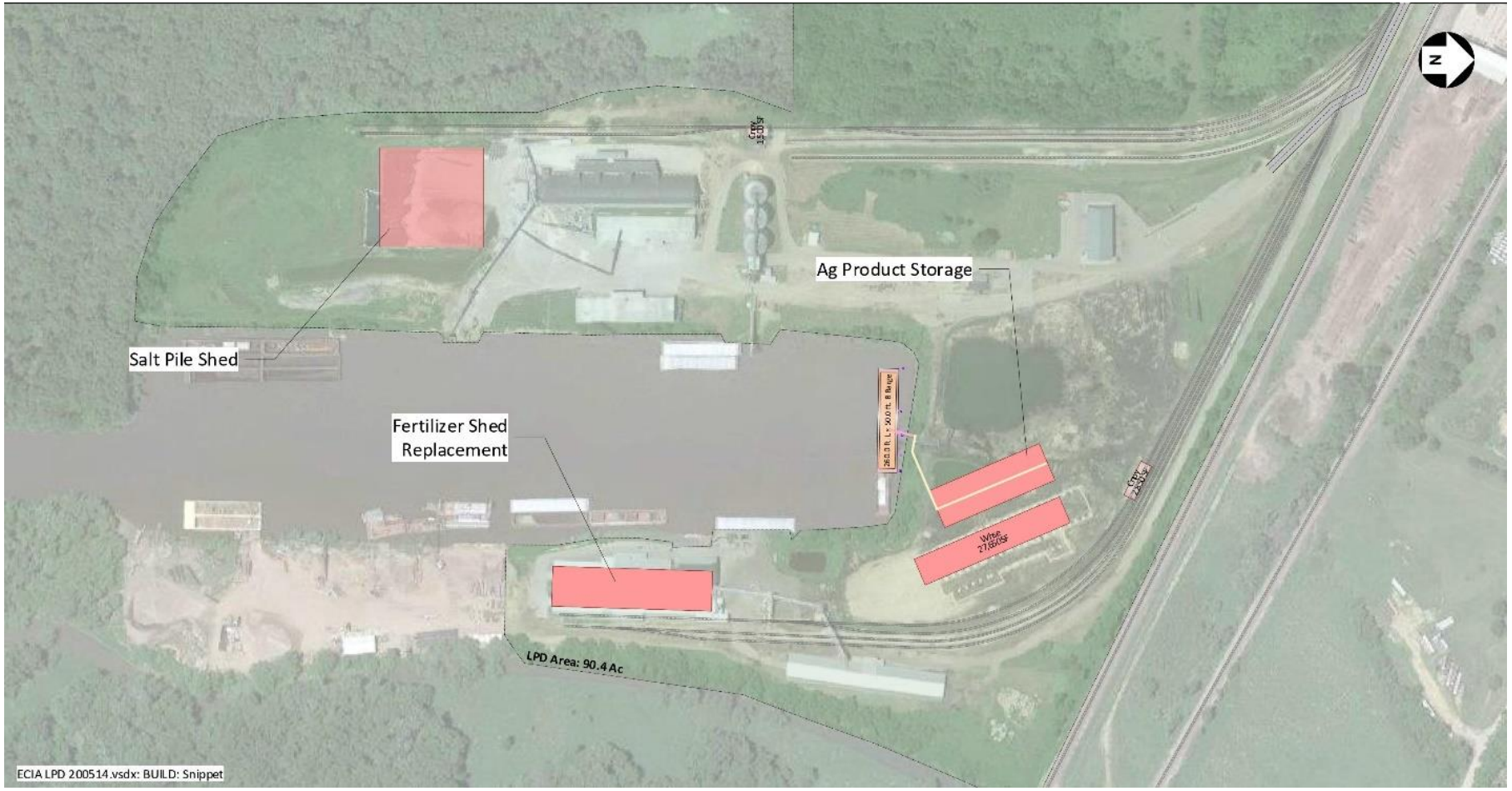
Figure 7. Recommended Near-Term Improvements, Gavilon



LOGISTICS PARK DUBUQUE PROJECTS (2020-2025)

- *Repurpose the coal handling system to transfer "hard to handle" processed grain by-products from rail (and truck) to barge* – The last shipment of coal to the facility occurred in 2015, leaving a sizeable portion of the port idle. The "ECIA Port Expansion Study" identified an opportunity for the Dubuque region to transfer up to 300,00 tons of processed grain by-products (dried distiller grain, soybean meal, corn gluten meal and pellets) from rail to barge annually. Logistics Park Dubuque will make incremental changes and additions to its existing coal system and barge loading infrastructure to capture this market, including weighing improvements, road upgrades, and a storage structure to amass barge load quantities for shipment. When operational, the facility will be able to transfer product to barge at up to 300 tons per hour.
- *Replace 15,100 tons of fertilizer storage buildings that are at the end of their usable life and were built with inefficient handling systems* – Storage sheds built almost 40 years ago were designed to be filled using front-end loaders rather than with conveyors. Carrying product takes significantly longer (14-16 hours versus less than 6 hours). This inefficiency is especially problematic given the seasonal nature of fertilizer. The existing low-profile buildings (16' tall) also take up a larger footprint than modern storage sheds (30' or higher). Logistics Park Dubuque will increase storage capacity with larger buildings, enabling the facility to handle more and/or new products. U.S. DOT resources will be leveraged by conveying structures that the port already has in place for other buildings, requiring Logistics Park Dubuque only to make an incremental investment to feed the modern storage structure.
- *Install a new, fixed 250' x 260' fabric-covered structure for the facility's 70,000-ton salt pile* – Every year, approximately 70,000 tons of road salt is sourced to customers including the Iowa and Illinois transportation departments, regional municipalities, counties, and other stakeholders. As required by law, suppliers pay to cover (tarp) the pile at a cost of up to $70,000 annually. In addition, Logistics Park Dubuque must maintain a stormwater runoff pond to capture salt brine. Not only is the annual tarping an on-going expense, the pond occupies ~1.25 acres of prime waterfront property that could be used to store or transfer other products. Logistics Park Dubuque seeks to cover the salt pile with an economical ClearSpan salt storage structure. This covered, waterproof building will keep rain and snow off piles, eliminating the possibility of salt leaching out and contaminating the surrounding area. Trucks, loaders, and plows can drive inside and easily maneuver throughout, due to the high clearance and lack of internal support columns. Natural ventilation and abundant light that the fabric covers provide also create an atmosphere that keeps moisture and condensation from affecting the quality of the salt.

Figure 8. Recommended Near-Term Improvements, Logistics Park Dubuque



BENEFIT EVALUATION

The study team prepared a "grant grade" benefit-cost analysis (BCA) for the near-term project recommendations, to support applications for Federal discretionary grant funding. Without the project, the loss of marine terminal capacity and operability will force the proven base of regional freight customers to rely on out-of-region ports. With the recommended program, the region will not only avoid the loss of existing capacity and business, but also position itself for growth, additional market opportunities, and improved rail service. The total program has a capital cost of $29.29 million and monetized benefits of $147.22 million over 30 years, without discounting. With 7% per year discounting, the program has a capital cost of $20.81 million and benefits of $40.97 million, producing net benefits of $20.16 million and a Benefit-Cost Ratio of 1.97.

Table 8. Near-Term Project Costs

Description	Cost
Rail for 7th Street and Dove Harbor Connection	$3,944,020
Dove Harbor Fertilizer Storage/ Loadout	$3,251,730
7th Street Fertilizer Storage Replacement	$11,823,500
Ag Products Handling and Storage	$5,136,000
Replacement of Existing Fertilizer Storage	$3,210,000
Cover Existing Open Salt Pile	$1,926,000
TOTAL	$29,291,250

Table 9. Near-Term Project Benefits

Undiscounted Benefits	
Transportation Effects	67.2 million truck VMT avoided 1.9 billion rail ton-miles avoided
Safety	1.7 fatal crashes avoided 39.5 injury crashes avoided 94.0 property damage crashes avoided
Good Repair	$1.6 million in avoided pavement damage savings $15.9 million in facility operations and maintenance savings
Economic Competitiveness	$96.3 million in truck and rail operating cost savings
Environmental Protection	12.3 million gallons of fuel consumption avoided 125.343 metric tons of carbon emissions avoided 5.6 metric tons of particulate matter emissions avoided 307.4 metric tons of nitrogen oxide emissions avoided 33.4 tons of volatile organic compound emissions avoided

Long-Term Needs and Recommendations

The long-term opportunities for Gavilon and Logistics Park Dubuque focus on capturing proven market demand and positioning for new business opportunities beyond the five-year timeframe of the BUILD/PIDP projects. Conceptual development plans were prepared for each site through the year 2040, in collaboration with the terminal operators and in consultation with other study partners.

GAVILON PROJECTS (2025-2045)

For Gavilon, the primary opportunities include:

- Expansion of fertilizer storage capacity on the current leasehold.
- Expansion of salt storage capacity on the current leasehold.
- Expansion of grain storage capacity on the current leasehold.
- Utilization of the new Seventh Street Connector (planned by the City of Dubuque) for access.
- Expansion of the current Gavilon leasehold into a portion of the former Alliant Energy Plant, with the development of open storage for steel rebar and the potential for additional open/covered storage for other future commodities, along with reactivation of the existing coal dock for barge transfer; note this is a newly-proposed concept and will require further discussion between the responsible parties, and there are no commitments in place.

The proposed Long-Term Development Plan for the Gavilon terminal includes the following projects in addition to the BUILD/PIDP projects, and is shown on Figure 9 and Figure 10 following.

- Fertilizer Expansion at Dove Harbor:
  - Purpose: Fertilizer storage expansion in Dove Harbor to provide additional capacity.
  - Area/Volume: Volume = 206,000 cu. ft. additional
  - Capacity: ~43,000 tons/year
- Salt at Salt Harbor:
  - Purpose: New open storage and expansion of existing open storage in Salt Harbor to capture identified demand.
  - Area/Volume: Area = ~40,000 sq. ft.
  - Capacity: ~139,000 tons/year
- Liquid Bulk at Salt Harbor:
  - Purpose: To capture liquid bulk commodity as such as Ethanol.
  - Area/Volume: Volume = 396,000 cu. ft.
  - Capacity: ~80,000 tons/year

- Grain Silos at 7th Street
  - Purpose: Provide additional grain storage to supplement existing capacity to meet future grain demand.
  - Area/Volume: Volume = 377,000 cu. ft.
  - Capacity: ~1M tons/year

- Breakbulk (Rebars) at 7th Street:
  - Purpose: Account for loss of steel storage in other areas and provide capacity for flexible future open/covered storage to meet new commodity opportunities, by utilizing a portion of the former Alliant Energy plant.
  - Area/Volume: Area = 3.5 acres
  - Capacity: ~73,000 tons/year

Figure 9. Proposed Long-Term Development Plan, Gavilon (Seventh Street)

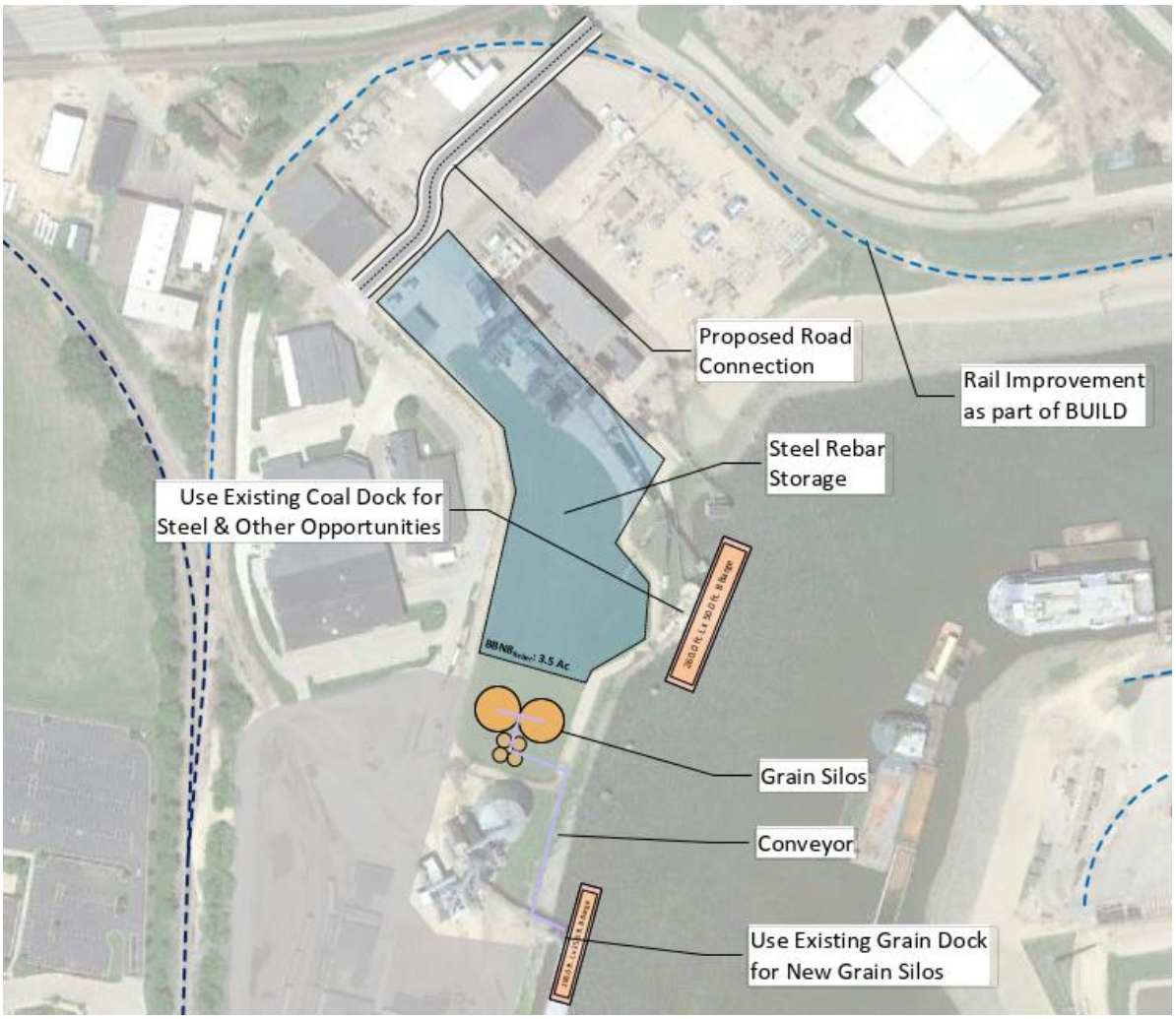
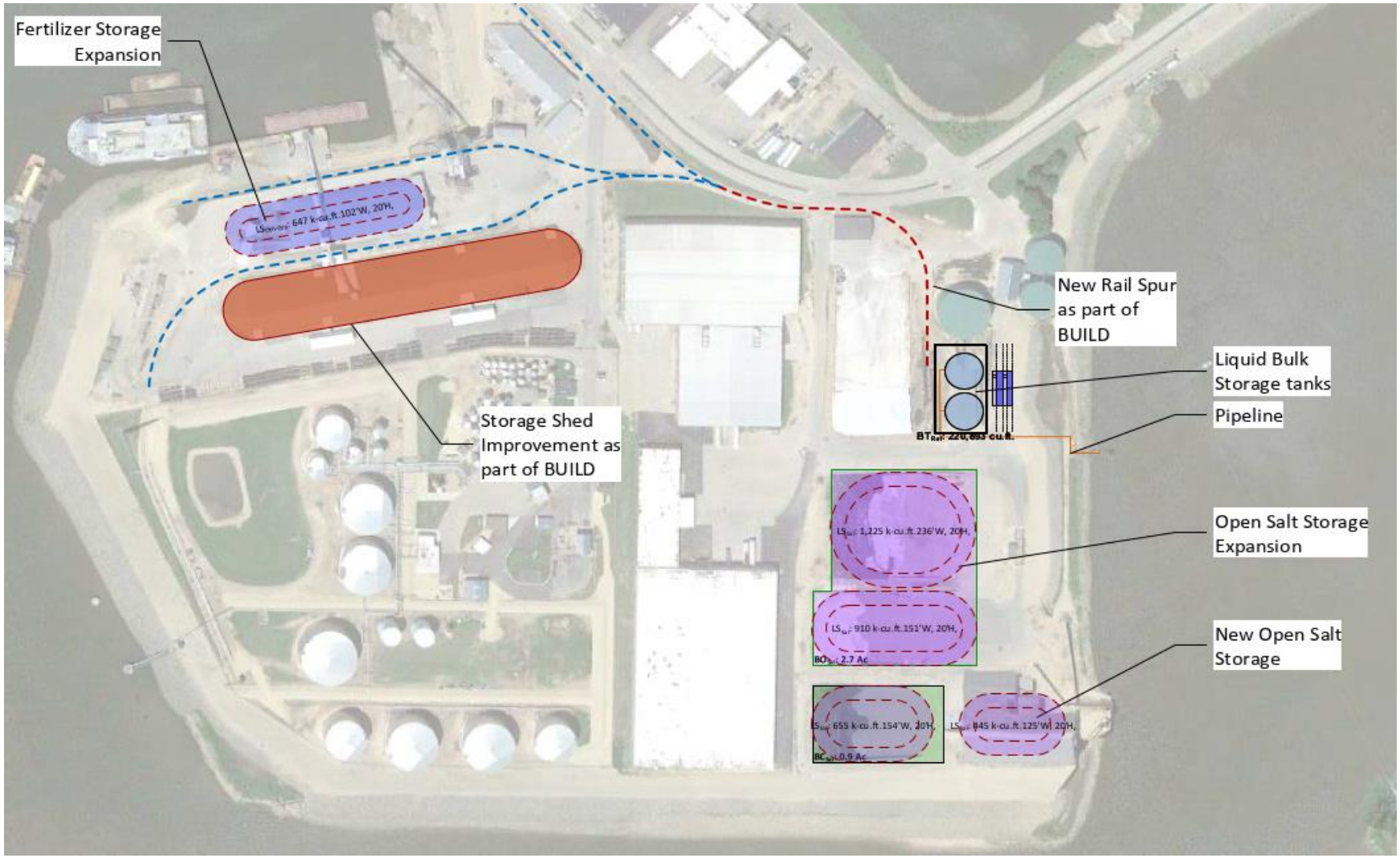


Figure 10. Proposed Long-Term Development Plan, Gavilon (Dove Harbor and Salt Harbor)



LOGISTICS PARK DUBUQUE (2025-2045)

For Logistics Park Dubuque, the primary opportunities include:

- Substantial improvement of the US 20 / Barge Terminal Road intersection, which is being designed and implemented by the Illinois Department of Transportation as part of a larger program of safety improvements for the US 20 corridor between East Dubuque and Freeport.
- Expansion of fertilizer storage capacity; expansion of salt storage capacity; and provision of new capacity for opportunity commodities including wood pulp and ethanol, along with a new dock.

The proposed Long-Term Development Plan for Logistics Park Dubuque includes the following projects in addition to the BUILD/PIDP projects, and is shown on Figure 11 and Figure 12 following.

- US 20 / Barge Terminal Road Improvements:
  - Longer truck access / egress / merging lanes and better grades
- Fertilizer:
  - Purpose: To capture the market for additional demand for fertilizer
  - Area/Volume: Area = 1,611,000 cu. ft. in two warehouses; note that the long-term plan would slightly modify the location and alignment of the Agricultural By-Products storage building proposed as a BUILD/PIDP project
  - Capacity: ~294,000 tons/year
- Salt:
  - Purpose: Expansion of existing salt storage at Dock 4 to address the demand.
  - Area/Volume: Volume = 1,640,000 cu. ft. (total salt storage)
  - Capacity: ~270,00 tons/year
- Liquid Bulk (longer-term opportunity):
  - Purpose: To capture liquid bulk commodity as such as Ethanol.
  - Area/Volume: Volume = 324,000 cu. ft.
  - Capacity: ~65,600 tons/year
- Wood Pulp (longer-term opportunity):
  - Purpose: To capture the market for wood pulp and address the possible demand.
  - Area/Volume: Area = 39,000 sq. ft. warehouse
  - Capacity: ~65,600 tons/year
- New Dock #5 to serve Salt, Liquid Bulk, Wood Pulp commodity transfer

Figure 11. Proposed Long-Term Development Plan, Logistics Park Dubuque Access via US 20

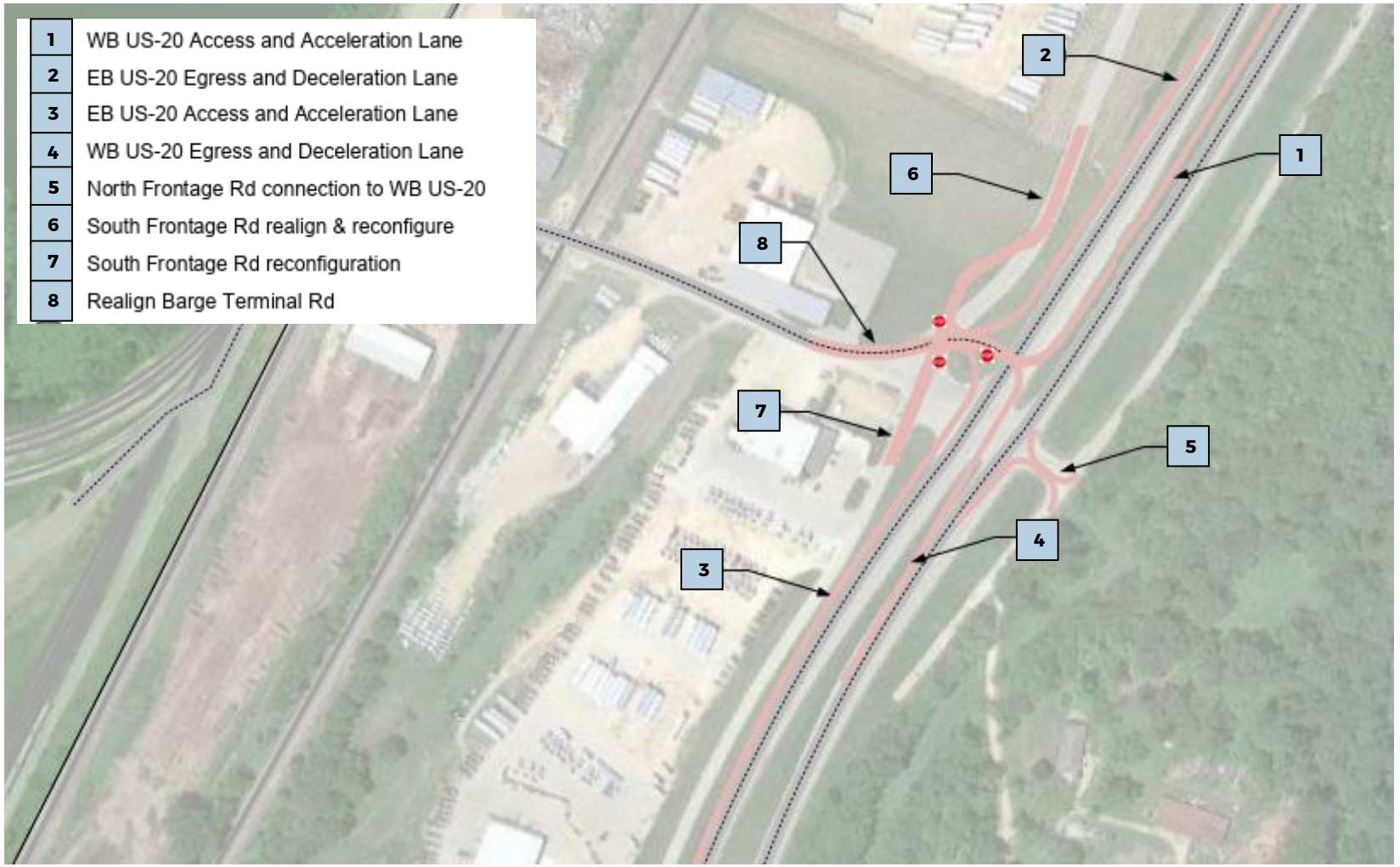
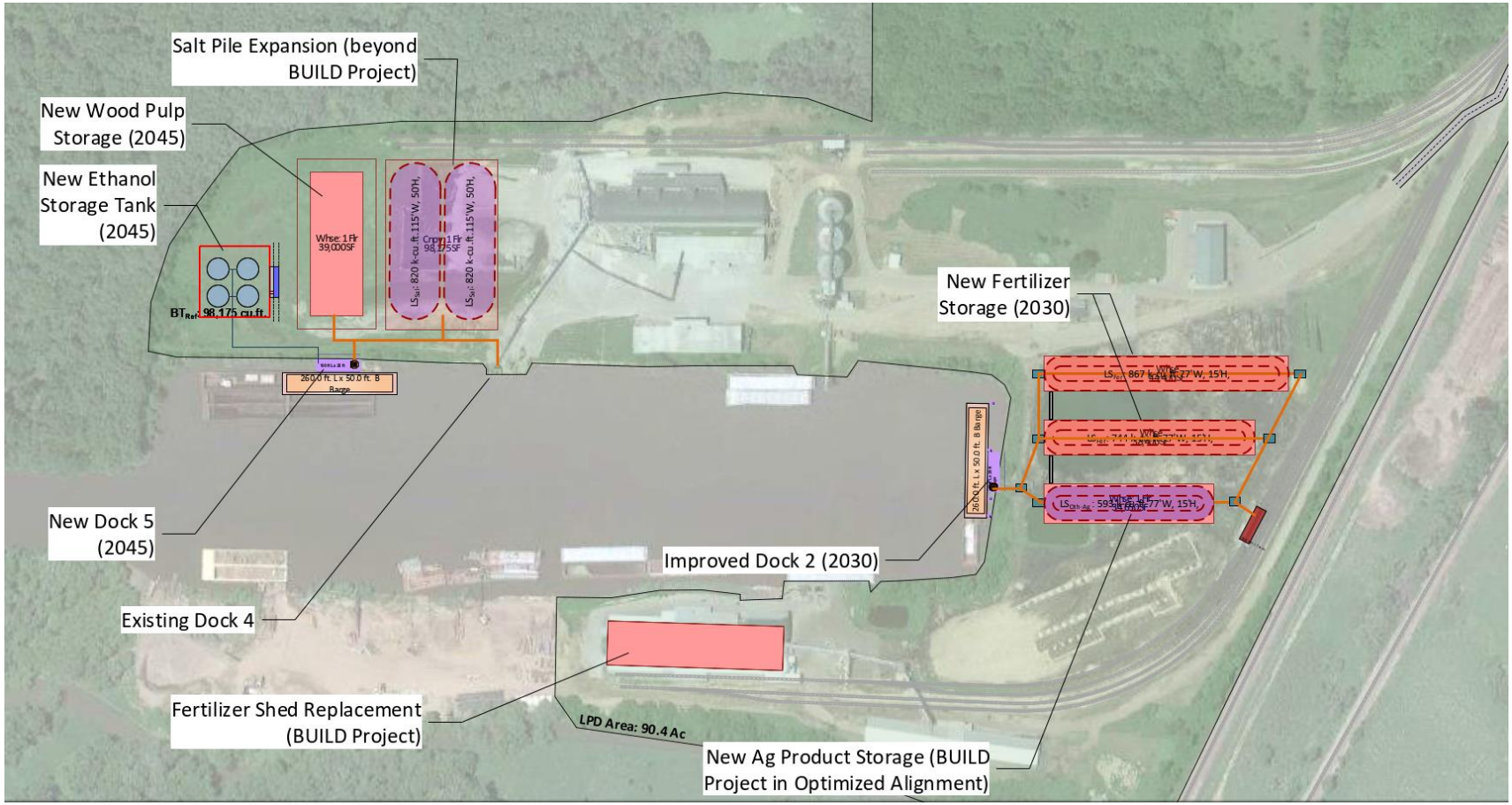


Figure 12. Proposed Long-Term Development Plan, Logistics Park Dubuque Terminal Facility



BENEFIT EVALUATION

The primary benefits of the long-term marine terminal projects are the provision of substantial additional marine cargo capacity for a diversified range of proven commodities and new business opportunities. While the near-term BUILD/PIDP projects emphasize state of good repair improvements to support ongoing operations, the long-term improvements are intended to strategically position Gavilon and Logistics Park Dubuque for effective market capture and growth through the year 2045.

Table 10. Long-Term Project Benefits – Cargo Capacity

	Current Capacity	BUILD/PIDP projects (2025)	Long-Range Plan (2025-2045)
Logistics Park Dubuque			
Fertilizer	454,000	454,000	748,000
Grain	511,000	511,000	511,000
Salt	130,000	130,000	270,000
Ag By-products	215,000	298,000	298,000
Wood Pulp	-	-	20,000
Ethanol	-	-	65,600
Total	**1,310,000**	**1,393,000**	**1,912,600**
Added in Phase		83,000	519,600
Gavilon			
Fertilizer (Dry)	629,000	702,000	702,000
Fertilizer (Liquid)	162,000	162,000	162,000
Grain	723,000	723,000	1,725,000
Salt	255,000	255,000	394,000
Steel	29,000	29,000	102,000
Dry Corn	210,000	210,000	210,000
Other Liquid Bulk	-	-	80,000
Total	**2,008,000**	**2,081,000**	**3,375,000**
Added in Phase		73,000	1,294,000

CONCLUSIONS AND NEXT STEPS

The long-term program recommendations represent the final component of the ECIA Port Expansion Study. Moving forward, key milestones and implementation steps include:

- Results of BUILD/PIDP Grant Applications, and potential future grant applications if the current submittals are not successful
- Implementation of the US 20 / Barge Terminal Road improvements by Illinois DOT
- Advancement of on-terminal improvements (design, permitting, and construction) by Gavilon and by Logistics Park Dubuque, in collaboration with responsible local and state agencies
- Discussions between Gavilon and the City of Dubuque regarding potential availability and use of the former Alliant Energy site as part of the recommended long-term program

The ECIA region's ports are critical transportation and economic assets. The ECIA Port Expansion Study is intended to highlight their value to the bi-state region, and the role they play, and to provide a market-feasible foundation for their future growth and continued success through the year 2045.