

The Vital Role of U.S. Transportation Infrastructure in Moving Agriculture Forward

Written for the Coalition for America's Gateways and Trade Corridors By: Mike Levin, Director of Issues Management Analysis, Illinois Soybean Association

Executive Summary

Farmers depend on the availability of waterways, roads, bridges and railways to keep agricultural commodities moving to market efficiently and economically. Exports account for a significant proportion of many commodities' original crop production. For example, the United States exported 47 percent of total soybean production and 15 percent of the total corn crop in 2016.^{1,2} The reliability and efficiency of logistics and transportation networks is critical for shipments to remain competitive in international markets.

The United States has historically had a very strong transportation system. This basic advantage to be able to competitively source and deliver goods and raw materials is slipping as infrastructure maintenance and improvements fall behind, and funding diminishes at the state and federal levels.³ The inability to support investments in the transport network has resulted in an aging U.S. transportation infrastructure that is unable to keep pace with the growing demands of modern agricultural production.

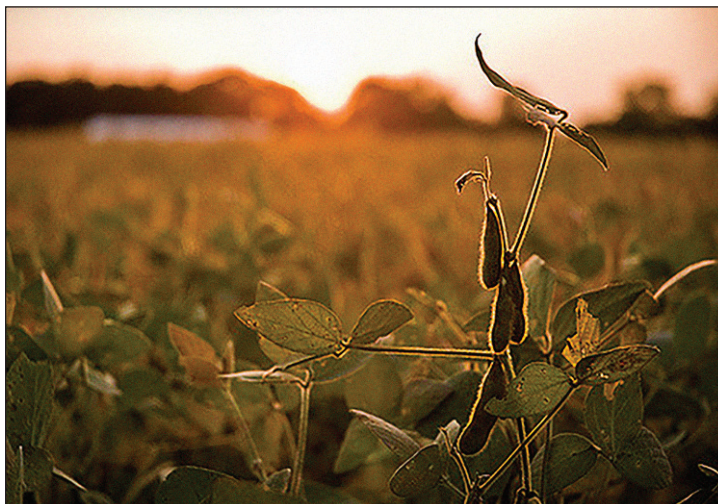
Farmers are faced with having to move increasing volumes of crops through rural areas, which often have relatively worse infrastructure than urban areas. For example, the trade in grains and oilseeds has continued to rise as per-acre production has increased, growing on average between 2 percent and 3 percent per year from 1964 to the present.⁴ And yet, the United States spends less on transportation infrastructure as a percentage of gross domestic product (GDP) than any of its major trading partners and less than at any point since World War II. Globally, the United States ranks only 12th in quality of overall infrastructure and 13th in quality of roads.⁵

At a minimum, transportation infrastructure maintenance is essential, but our network truly requires improvement and expansion to meet growing demands. According to the American Society of Civil Engineers (ASCE), at current pace, improvements to surface transportation, rail, ports, inland waterways, dams, levees, other water infrastructure and airports combined is nearly \$1.4 trillion short of what will be needed over the next 10 years.⁶

Introduction

The themes of this challenge to resource management can be applied across the agriculture spectrum. Yet, because of soybeans' significance to the U.S. economy, the focus here is on soybeans, grown in 31 states across the nation. The United States is the leading soybean producer and exporter. The total value of the U.S. soybean crop was \$34.5 billion in 2016, according to the American Soybean Association (ASA). Furthermore, soybeans, commonly rotated in fields with corn production, are the second most planted field crop in the United States after corn. Processed soybeans are the world's largest source of animal protein feed and the second largest source of vegetable oil.

Approximately 60 percent of the soybeans grown in Illinois, the top soybean-producing state, are exported to foreign markets each year with a value estimated at \$3 billion. Illinois is uniquely situated with prime access to



navigable waterways, major rail lines and vast interstate highways, creating advantages to move soybeans around the world efficiently and economically. However, deteriorating infrastructure is impacting Illinois soybeans' competitiveness in the global market, consequently increasing costs for Illinois farmers.

America's Agriculture: Built on Infrastructure

Robust, efficient infrastructure for moving agricultural commodities to market is important to farmers and agribusinesses as it allows them to make sales and deliver products on time and in good shape – and make a profit. One key purpose of U.S. waterways, roads, bridges and railways is to move products more efficiently, cost effectively and reliably than competing countries. Maintaining infrastructure reduces financial burdens for farmers and boosts their efficiency. By providing access to optimal transportation routes that take into account the utility of the various freight movement modes, infrastructure can contribute to both economic and environmental sustainability.

Investments in infrastructure keep transportation costs low and are critical to the U.S. agriculture industry maintaining its dominant position among the world markets. While the United States is ranked third in economic competitiveness among 138 nations, as scored by the World Economic Forum (WEF), it is only 11th in the WEF's most recent ranking for transportation infrastructure.⁵

For example, in 2016, the United States led the world in soybean production with 3.93 billion bushels, followed by Brazil at 3.67.⁷ However, differences in transportation costs for some destinations and routes can make South American soybean exports more profitable than those of the United States, diverting trade from the United States to sources in Brazil or Argentina. The reverse can also be true when U.S. infrastructure offers greater competitiveness for the export of national goods. Transportation costs and public or even private investments in infrastructure improvements are critical factors that can enhance U.S. agricultural production, particularly soybean competitiveness in international markets.

The Declining State of U.S. Infrastructure

The aging U.S. transportation infrastructure is eroding the economic competitive advantages for our nation's agriculture industry. Every four years, the ASCE assesses and reports on the state of the country's infrastructure. In 2017, the ASCE graded overall American infrastructure a "D+" (or the equivalent of "poor, at risk" on an A through F grading scale); roads received a "D."⁶

Crumbling roads, inadequate railways and aged waterway locks and dams make our agriculture industry less competitive in domestic and international markets today, damage efficiency and productivity, as well as foreshadow increases in the future cost basis for farmers.

State of Roads and Bridges

The initial journey for agricultural commodities going to market begins on rural roads and bridges. The state of Illinois alone has nearly 150,000 centerline miles of roads and more than 26,000 bridges. On a national level, the highway system is made up of more than 4 million miles of public roads. As America's primary mode of shipping goods,⁸ our roadways and bridges are in serious need of maintenance and capacity expansions.

Since 1980, the total distance driven annually by all U.S. vehicles has doubled to 3 trillion miles.³ Despite this, mileage on public roads and streets constructed have only increased 9 percent, with total lane miles up just 11 percent.³ The result is costly: freight bottlenecks on highways across the United States cause more than 243 million hours of delay to trucks annually, resulting in a loss of \$6.5 billion.

As for the nation's more than 600,000 bridges, according to the ASCE, one in 11 is rated as structurally deficient, and on average there are 188 million trips across a structurally deficient bridge each day.⁶ In addition, the American Trucking Associations (ATA) report that 67,000 bridges countrywide are either closed or posted for reduced truck loads, hampering delivery routes.³

Those numbers translate to congestion, wasted hours and excess fuel burned. The country's 3.4 million commercially licensed truck drivers sit in stalled traffic for about 728 million hours a year, and the ATA estimates traffic congestion costs American truckers \$50 million per year.³

In Illinois, 42 percent of major roads are rated to be in poor or mediocre condition, and nearly 16 percent of the state's bridges are structurally deficient or functionally obsolete.⁹ As crop yields grow and trade patterns change, it is even more important to maintain and improve the already stressed and aging system to avoid additional strains and to keep the United States competitive in the marketplace. As traffic patterns change, not all roads and bridges require improvement, but priority corridors must receive sufficient allocations of resources to enable efficient freight and passenger movements and a robust economy.

State of Waterways

The United States boasts more than 25,000 miles of coastal, intracoastal and inland waterways, which are essential to agriculture's success, particularly for moving products to export. According to the American Waterway Operators (AWO), annual traffic on America's inland navigation routes carries the equivalent of 58 million semi-truck trips each year.



Waterways must now accommodate cargo ships of ever-increasing size.

In anticipation of last year's big harvest, the movement of barges with farm commodities during summer 2016 more than doubled the three-year average, according to the U.S. Department of Agriculture (USDA). With such high volumes of products being carried on these marine highways, it is vital to ensure that waterway infrastructures like locks and dams are being properly maintained. Waterways are especially important for soybean producers, as 58 percent of U.S. soybean exports exit the country via the Mississippi River's Gulf ports alone.³

The ASCE gave the nation's inland waterways and rivers a D grade in its 2017 assessment,⁶ and it's clear why: the U.S. system of locks and dams is outdated and in dire need of maintenance and repair. In many cases, inland waterways systems have not been comprehensively updated since the 1950s, and more than half of the locks are over 50 years old. The LaGrange Lock on the Illinois River is 80 years old, with concrete crumbling and other critical components difficult to maintain.

The volume of traffic handled by our nation's inland waterways is substantial, and so are the risks from system failure. Repairs can take days, weeks or months, often with no advance notice to shippers, carriers or others who depend on these resource corridors for their businesses. The ASCE estimates that between 2000 and 2014, the average delay per lock nearly doubled and that 49 percent of vessels experienced delays in 2014.⁶ To make things worse, projects to repair, rehabilitate or eventually replace aging locks and dredge-silted channels take decades to approve and complete.

According to the U.S. Army Corps of Engineers (Corps), Rock Island District, more than \$23 billion in commodities are shipped on Illinois' inland waterways annually. However, the backlog of deferred maintenance projects is \$599 million and growing.¹⁰ The Corps has performed admirably given that the maintenance needs and capital investment requirements of the aging lock infrastructure on the Illinois Waterway dwarf the annual funding appropriated by Congress for operations and maintenance of this important, but fragile, federal infrastructure system.

State of Railways

The U.S. rail network, made up of more than 140,000 miles of railway tracks, over 100,000 rail bridges and related real estate,⁶ moves 1.9 billion tons of cargo a year, or about a fourth of the world's rail freight.¹¹ For example, approximately 109 million bushels of soybeans originate from Illinois by rail annually.¹²

However, rail infrastructure is struggling to provide adequate capacity for the increase in commodity movement, as soybean farmers continue to break yield records and other crops are produced in surplus volumes relative to market demand levels. Increasing demand for rail transportation coupled with a finite amount of available rail capacity means rail freight rates will continue to rise as both ag and non-ag industries vie for limited space.

A Soy Transportation Coalition checkoff-funded study found that U.S. soybean exports are increasingly dependent on rail. The study suggests that a \$1.55 billion funding gap will exist annually between 2012 and 2035, as expected rail investments for maintenance, repair and expansion needs increase due to additional volumes of soy along with growth in freight tonnage overall.¹²

Reasons for Disrepair

It is clear that our nation's infrastructure is in serious need of repairs, but there are many challenges to secure the necessary funds. One reason funding is inadequate is due to the burdens placed on small, rural counties to cover their local cost share of public projects. Populations of rural counties have been generally declining. The tax base to draw upon for improvements is diminishing, along with rural population reductions. Approximately 70 percent of counties are rural (have fewer than 50,000 people), yet counties own 46 percent of public road miles and nearly 40 percent of bridges.³ County budgets rely principally on property taxes, but most states restrict these.

The more damage and deterioration that infrastructure sustains, the more expensive projects become. Some counties simply can't afford to keep up with optimized maintenance schedules and instead defer critical improvements, which can lead to catastrophe. State and local spending on infrastructure has dropped to its lowest level in three decades. The lack of funding at state and federal levels also leaves a gap: according to the ASCE, at the current pace of approvals, improvements to surface transportation, ports, inland waterways, dams, levees, other water infrastructure and airports combined is nearly \$1.4 trillion short of what will be needed.

Investment is Critical for Long-term Economic Growth

The costs to the U.S. economy of ignoring infrastructure needs, along with the costs to catch up with repairs, have jumped since 2013 and will continue to swell.⁷ In fact, the cost to U.S. economic output, if gaps in infrastructure investments aren't met, has been conservatively calculated to be nearly \$4 trillion by 2025,⁶ and there will likely be dramatic increases in construction costs as time goes on.⁷ In contrast, fulfilling projected investment needs would, consequently, increase productivity growth, providing measurably lower U.S. inflation by as much as one full percentage point.⁷

U.S. ag exports trigger more economic activity. These exports are dependent on the transportation system. Many analysts believe that infrastructure pays for itself by growing the economy and tax base. According to Moody's Analytics, on average, for each dollar spent on infrastructure projects there is a return of \$1.44 to the economy. Investments in new technology infrastructure are also necessary for the United States to stay competitive in a global market.

Building out wireless transmission networks is essential for agribusinesses and rural America, which need access to new technology to support precision farming, to improve yields and reduce wasteful inefficiencies and to remain globally competitive. For example, California almond farmers use wireless computer data analysis to track the needs of nut groves through the soil. This enables their systems to provide precise levels of water and fertilizer, saving money and using resources more efficiently, only in amounts required for production optimization, which was especially vital during California's drought.

Agricultural commodities are commonly time sensitive, so the inability to quickly and reliably move goods directly impacts farmers' and agribusinesses' bottom lines. Resilience and supply chain elasticity is needed across the agricultural freight transportation system to take advantage of huge bumper crops and episodes of high volume in particular regions, as well as for important freight routings across corridors and via strategic ports.

According to the USDA, U.S. farm exports were worth twice as much in 2016 as they were just 10 years previously. To continue this expansion, these exports depend on strength in all modes of transportation. System inefficiencies can destroy an entire year's profit. For example, in November of 2014, a slowdown at major West Coast ports (which handle about half of U.S. pork exports) backed up shipments, costing the U.S. meat and poultry sectors

an estimated \$40 million a week for nearly four months.¹³ According to the National Pork Producers Council (NPPC), this episode emphasizes the need to maintain the wide range of options that comprise our nation's infrastructure.

The Economic Importance to Today's U.S. Public

The transportation infrastructure needs of the U.S. agriculture industry extend to today's general consumers as well. With estimates showing that the world population will exceed 9 billion by 2050, food production must increase in order to feed a growing population. Increased volumes of food will only make it to market if our transportation networks can expand capacity and make improvements to cost effectively sustain the increased volumes. Because of this, food prices will increase if infrastructure availability declines or infrastructure quality worsens, affecting the yearly cost of food for individual consumers.

Infrastructure investment is also needed to keep rural communities strong, connecting America's countryside to markets around the globe. We need reliable, resilient and robust infrastructure to draw Americans to live in rural areas, including access to new technologies, like wireless internet, that have become essential to everyday life.

In addition, U.S. car and truck traffic is impacted by gaps in infrastructure updates. According to Texas A&M's Urban Mobility Scorecard, congestion cost drivers 7 billion extra hours in 2015, or about \$160 billion in fuel alone. And, this is not just a big city problem – for cities with fewer than 500,000 people, congestion is four times worse than it was in 1982.¹¹

Solutions: Current Actions to Improve the System

Despite recent federal efforts to bridge the funding gap, transportation funding remains inadequate and transportation improvement and maintenance projects are still sorely in need of resources.

At the federal level, investments have been authorized through legislation. They include the Fixing America's Surface Transportation Act (FAST Act) and the Water Infrastructure Improvements for the Nation (WIIN) Act, which included the Water Resources Development Act (WRDA) of 2016. Federal funds made available through the Transportation Investment Generating Economic Recovery (TIGER) grants and the FAST Act's Nationally Significant Freight and Highway Projects Program provide an opportunity for applicants to compete against each other to receive funding for significant projects.

To improve waterways, Congress beefed up the annual Army Corps navigation project budget to more than \$6 billion, up about \$1 billion from previous years. In 2014, Congress increased its share of costs to finish the Olmsted Lock on the Ohio River from 50 percent to 85 percent. There has also been a 45 percent hike in the federal tax paid on a portion of the inland waterways for towboat fuel, which marginally boosts revenue for the Inland Waterways Trust Fund (IWTF). It should be noted, however, that this increase merely corrects purchasing power, which had corroded due to years of inflation combined with an unchanged user fee. For more than two decades, the IWTF diminished in value as the user charge remained stagnant between 1995 and April 2016.

Private investments in the transportation system are significant as well. According to a 2016 American Association of Port Authorities (AAPA) survey, ports and their private sector partners increased capital spending intentions from \$46 billion between 2012 and 2016 to \$155 billion between 2016 and 2020.¹⁴ The American Association of Railroads (AAR) reports that the seven biggest U.S. freight rail companies by revenue (Class 1) plan to invest more than \$22 billion in their infrastructure and equipment in 2017.¹⁵ In just the past three years, 1,400 locomotives have been added, responding to surging demands that prompt movement of a wide range of commodities.³ A survey of Coalition for America's Gateways and Trade Corridors (CAGTC) members shows a total of more than \$45.7 billion in need for large-scale, competitive grant style projects alone.

State and local investments are also essential to improving the transportation system, and many projects begin at the local level. For example, at least 16 states have raised gasoline and diesel fuel taxes to help fund highway projects.¹⁶ Many states are also implementing new efforts like Accelerated Bridge Construction (ABC) to make better use of their constrained budgets. With ABC, large components, or even the entire spans of small bridges, are mass produced before being brought to a bridge site for assembly. This mass production streamlines construction and allows for cost savings. Several states are also taking advantage of "bridge bundling," or selecting several bridges for replacement and bidding them all out in one or two contracts. These bids sometimes even cross local jurisdictions in support of regionalism, where building volume in corridors that compose the spoke and hub system can have a meaningful impact.

Conclusion

Investments to maintain, improve and expand U.S. transportation infrastructure will help keep transportation costs low and are essential to protecting the U.S.'s dominance in the world market. The reliability and efficiency of logistics and transportation networks are crucial for the competitiveness of the agriculture industry, which provides fuel, food and fiber while also sustaining the U.S. economy as a whole. Without these systems, trade in agricultural commodities, like the U.S. soybean industry, cannot remain competitive in global markets.

In 2013, Brazilian exports surpassed U.S. soybean shipments overseas for the first time, making Brazil the top soybean supplier worldwide. Experts attributed this primarily to differences in transportation costs, which made South American soybean exports more competitive than those of the United States.⁷ Without robust funding to maintain and improve the assets, the conditions of roads, bridges, railways and waterways will continue to decline, leading to increased user costs and reduced economic outputs.

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Prior to working for the ISA, Levin was acting as chief of staff to Illinois State Senator William Brady. In this capacity, he was a key member of the senator's executive staff, responsible for central coordination of activities and operations. Levin has worked as a lobbyist and manager within association management and government both in Illinois and Nevada.

About the Coalition:

The Coalition for America's Gateways and Trade Corridors (CAGTC) is a diverse coalition of more than 60 public and private organizations dedicated to increasing federal investment in America's intermodal freight infrastructure. In contrast to single mode interests, CAGTC's main mission is to promote seamless goods movement transportation system across all modes to enhance capacity and economic growth.