407-629-2185
165 Lincoln Avenue
Winter Park, FL 32789

PREPARED FOR

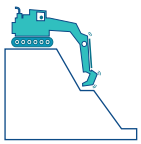
FDOT

FISCAL YEAR 23/24
2ND QUARTERLY REPORT

STRATEGIC RESOURCE EVALUATION STUDY
HIGHWAY CONSTRUCTION MATERIALS

CONTRACT BEC18

OVERVIEW: **FLORIDA'S HIGHWAY CONSTRUCTION MATERIALS**

Construction Material	Status
 ASPHALT	**Asphalt bids remained elevated in the second quarter of Fiscal Year 2023-24 (FY 2024), but within 5% of current forecasts.** Industry remains uncertain about the impact of global conflicts on crude oil futures, but outlooks are optimistic at this writing. Best estimates still expect some moderation in pricing before fiscal year end, ending about 6% higher than FY 2023 prices (with weighted average prices about $178/ton). The upper bound/worst case scenario could occur if inflation and global conflicts worsen. Regardless, high infrastructure demand is expected to keep asphalt bids high in FY 2024 and beyond.
 CONCRETE	**Structural concrete prices are also with 5% of forecasts, topping $1,400 a cubic yard through the second quarter of FY 2024.** Steep aggregate price increases, along with ongoing labor constraints, are affecting bottom lines and keeping bids high. As such, producers continue to report passing off costs increases to customers. Fly ash availability remains an issue, but there may be a new imported source into the Port of Tampa Bay by Pangaea Florida. The company is cleared to import cementitious products like clinker and fly ash for ten years.
 STEEL	**Steel prices continue to be volatile, with some fabricators reporting major increases next quarter and others successfully cementing cheaper deals with their suppliers.** Product stockpiles seems to have been drawn down as some FDOT fabricators report that material supplies are running low and some products are difficult to obtain. Structural steel forecasts predict a decline back to FY 2023 levels with updated industry data, but anecdotally mills have noticed customers of planned price increases. Reinforcing steel price increases continue to slow, with forecasts rising less than 1% so far in FY 2024 compared to FY 2023.
 AGGREGATE	**The FY 2024 FDOT weighted average aggregate base price is being skewed by one high-cost, high-quantity bid.** However, even after accounting for that outlier, the FY 2024 year-to-date weighted average price is a shocking $36 per square yard. Current pricing is about $8 higher than the best estimate forecast for FY 2024. Given second quarter bids, prices may moderate slightly throughout the remaining fiscal year, but FDOT may need to continue adapting to much higher costs.
 EARTHWORK	**As with aggregate, the same high-cost, high-quantity bid affected the Earthwork weighted average price through the second quarter of FY 2024.** Excluding this bid, the FY 2024 the weighted average earthwork price declines from $24 per square yard to $14. While above the FY 2023 year-end prices, the picture is not as dire as including the outlier bid would make it. Still, current earthwork forecasts are 10% higher than previous estimates with updated FDOT bid and industry data.

Primary Market Risks, Q2 FY 2024

Economic Slowdown

In an effort to curb rising inflation, the Federal Reserve **increased interest rates** at a pace not seen in decades over the last two years. While it takes time for monetary policy to work through the economy, the Fed has signaled that rate cutting may begin this year. The **manufacturing and housing sectors have already experienced recession** due to higher costs of borrowing. If the job market were to weaken, consumer spending could take a dive as well.

Renewed Inflation

Inflation is on the decline in the U.S., but still above the Federal Reserve's long-term target of 2%. The major driver of recovery has been **improvements in supply chains** across most sectors, which had been severely disrupted during the pandemic. Overall **employment** has also been steady over the last few years. However, **a slowdown in demand** may be necessary to curb inflationary conditions in the future.

Global Conflicts

China's weak economic recovery has helped to mitigate global inflation, including in the U.S. With conflicts breaking out in Ukraine, the Middle East, and elsewhere, however, global markets are in danger of disruption. Although crude oil, steel, and other construction materials markets have been only minimally impacted so far, trade blockades in the Red Sea and the potential for wider conflicts could endanger global recovery.

What to Watch and Potential Impacts to FDOT

Forecast information provided herein is based on the best available data and analysis of FDOT's bid experience over the past two decades. However, there are "wild card" risks in the larger macroeconomy that warrant monitoring in the background. What to watch for, and potential impacts to FDOT if these changes in macroeconomic trajectory suddenly transpired, include:

Economic Slowdown

With consumer spending accounting for more than 2/3 of U.S. GDP, and many of the COVID relief programs expiring, a rapid slowdown in consumer spending would affect government revenues. Florida is particularly reliant on consumer discretionary spending due to heavy tourism. Reduced revenues impact company decisions to expand, relocate or continue operations in a location, including contractors and materials suppliers. Impacts: short-run, potentially reduced investment by suppliers, reduced competition; mid-term, potentially reduced available funding.

Renewed Inflation

If the Fed does not maintain sufficiently tight financial conditions, inflation could pick back up, driving the Fed to return to interest rate increases. Avoiding a broad recession would become much harder. In addition to economic slowdown impacts (listed in the first panel), capital costs to suppliers would increase as well as commodities and wage costs themselves. Impacts: short-run, potentially renewed cost increases and shortages driven by uncertainty; long-term, firms adjust investment to higher costs and reduce staff, affecting schedules.

Global Conflicts

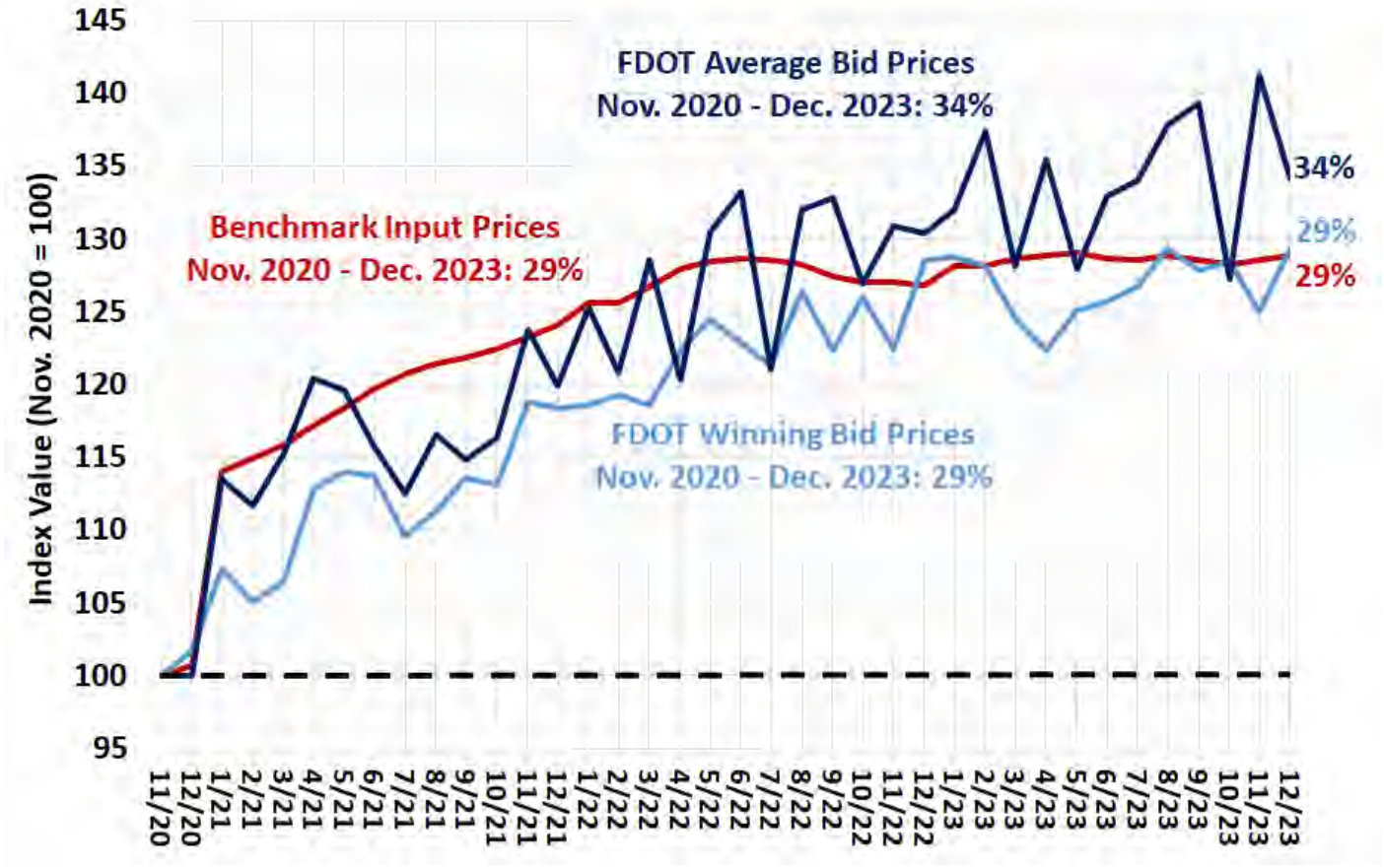
Impacts include supply chain disruptions similar to those seen just after COVID; greater volatility in crude oil prices, and higher potential for binder availability issues. Shipping disruptions may decline and war-time efforts could necessitate ramping up production of steel and other related products, diverting materials away from highway transportation projects. Imports of aggregates, cement, fly ash, binder, and other material inputs from outside the U.S. may be impacted as well.

FDOT Cost Index

The Florida Department of Transportation (FDOT) Cost Index is calculated by assessing awarded and average bids since November 2020. The share of aggregate, asphalt, concrete, and steel dollars spent on FDOT projects is compared to a baseline index that is calculated from regional industry prices; see **Figure 1**.

Winning contractor bids and benchmark input prices once again converged in December 2023 with revised bid and industry data. Winning bids and benchmark input prices were 29% higher than November 2020 prices at the end of calendar year 2023. Average bid prices remained elevated in December 2023 at 34% higher than pre-pandemic levels. FDOT's bid prices have been impacted by record high material costs. However, as the gap between average bid prices (calculated from all bids) and winning (awarded) bid prices remains wide, FDOT bidding activity is still competitive.

Figure 1. Florida Benchmark Input Prices vs FDOT Bid Prices



Source: TBG calculated from data provided by FDOT Office of the Work Program and Budget and FDOT Estimates Office and industry data.

Disclaimer

The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the State of Florida Department of Transportation

Prepared in cooperation with the State of Florida Department of Transportation.

Prepared by

Prepared for

The Balmoral Group
Web - www.balmoralgroup.us

Florida Department of Transportation

Head Office
165 Lincoln Avenue
Winter Park
Florida, 32789, USA
Phone 1 407 629 2185

Tallahassee Office
113 S Monroe Street
Tallahassee
Florida, 32301, USA
Phone 1 850 201 7165

Office of Construction
605 Suwannee Street
Tallahassee
Florida, 32399, MS-31, USA
Phone 850 414 4150

Sydney Office
Suite 1, Level 2
210 George St
Sydney, 2000, Australia
Phone +61 2 9247 9670

Report Authors – Valerie Seidel, Alicia Barker, David Osorio, Elizabeth Mandell

Contact
Valerie Seidel
President
407 629 2185
vseidel@balmoralgroup.us

Suggested citation:

The Balmoral Group, 2023. Strategic Resource Evaluation Study: Highway Construction Materials, FY 2023-24 Second Quarterly Report. The Balmoral Group, Winter Park, FL.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

The Florida Department of Transportation (FDOT) commissioned The Balmoral Group (TBG) to evaluate the availability and costs of critical highway construction materials in Florida. The evaluation includes an analysis of existing and planned supply of these materials, and an estimate of future costs and quantity requirements FDOT will face in fulfilling its five-year work program. Materials in the analysis include the bituminous, cement, steel, aggregate and earthwork markets. An annual assessment of the materials markets and significant trends affecting FDOT's supply availability and costs is included in this report.

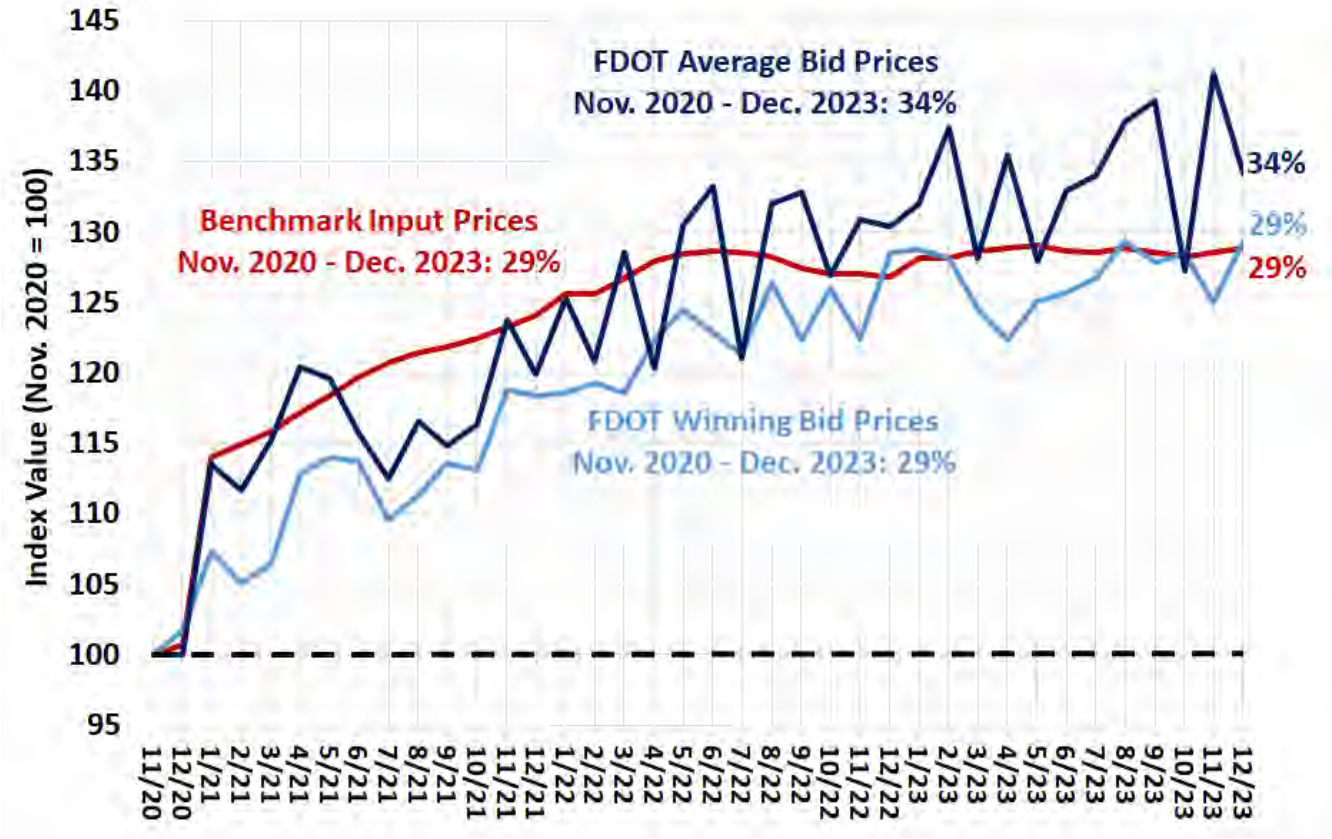
The report is organized as follows:

- **General Economic Landscape** for highway construction materials,
- **Work Program Work Mix** allocation and materials quantities estimates,
- **Material-specific findings** for supply chain variables, including
    - raw material sources,
    - existing and likely future transport and distribution methods,
    - potential impact of external forces including global markets, technological change, foreign materials, and environmental regulatory or permitting issues, as relevant,
    - forecasts of likely Florida supply and FDOT costs for the five-year work plan, and
    - GIS maps of existing supplier locations.

Input Costs vs. Bid Prices

In Florida, regional input prices through December 2023 were up 29% compared to November 2020 levels (**Figure 2**). For awarded (winning) FDOT bids, overall materials prices were also 29% higher than pre-pandemic levels over the same period, meeting industry inputs. For all FDOT bids (meaning the average of all bids received, not just winning bids), price increases held firm in December at 34% - exceeding benchmark input costs. Monthly cost composition by material is provided in **Appendix A**, along with an update on the Bureau of Labor Statistics (BLS) Producer Price Index (PPI).

Figure 2. Florida Benchmark Input Price vs FDOT Bid Prices



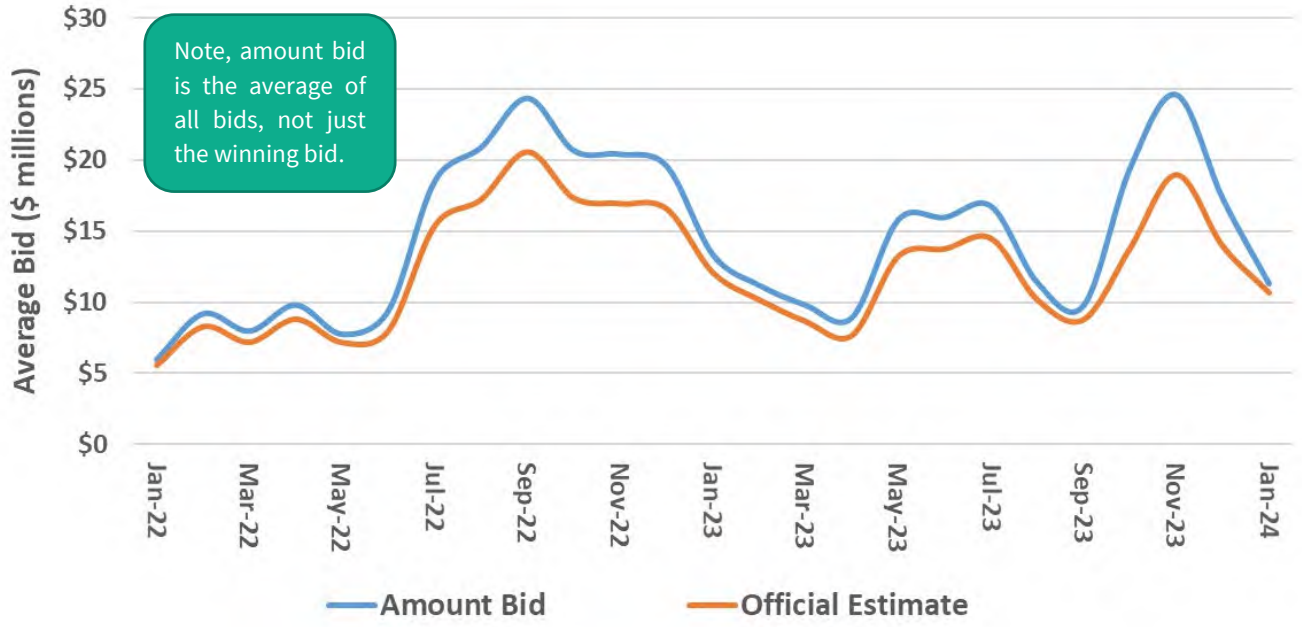
Source: TBG work product, calculated from data provided by FDOT Office of the Work Program and Budget and industry data.

Bid Data

Average bids provide insight to market trends; in economic terms, the expected value of a contract or project is the average of all bids. In this analysis, the average of all bids, or the mean, is compared to the official preliminary estimate. Using a 3-month rolling average, in the second quarter of Fiscal Year 2023-24 (FY 2024), the average deviation of all bids against all official preliminary estimates was 31%; significantly higher than previous quarters (**Figure 3**). However, these were influenced by a $193

million project in October 2023; if that one bid was excluded, the difference would drop to 14%. Excluding contracts exceeding an official estimate of $100 million from the analysis, the average deviation of all bids against all official preliminary estimates would be 0%.

Figure 3. Average Bid vs. Official Estimate. 3-month Rolling Average



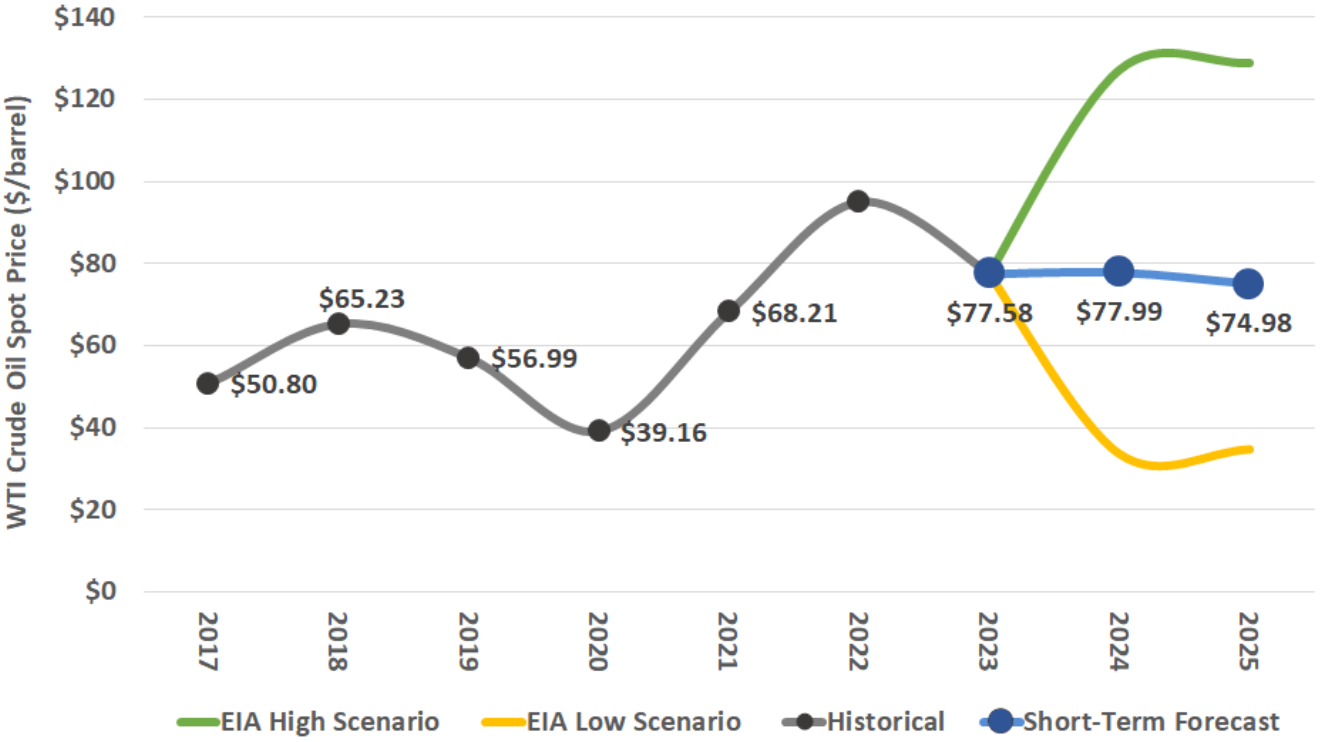
Source: FDOT; TBG Work Product.

Energy Prices

The U.S. Energy Information Administration (EIA) January 2024 Short-term Outlook reduced the 2024 forecast from $90.91 per barrel (as reported in October) to $77.99 per barrel as disruptions being factored into the higher price did not occur as a result of war in the Middle East (**Figure 4**). For 2025, EIA forecast crude oil prices to fall to $74.98. Crude oil prices declined 7% in December 2023 compared to the previous month. Year-over-year, crude oil prices were down 6% in December 2023. The very recent Middle East volatility still has the prospect of disrupting global oil prices, that could lead to a worst case/high range scenario (upper bound in **Figure 4**).

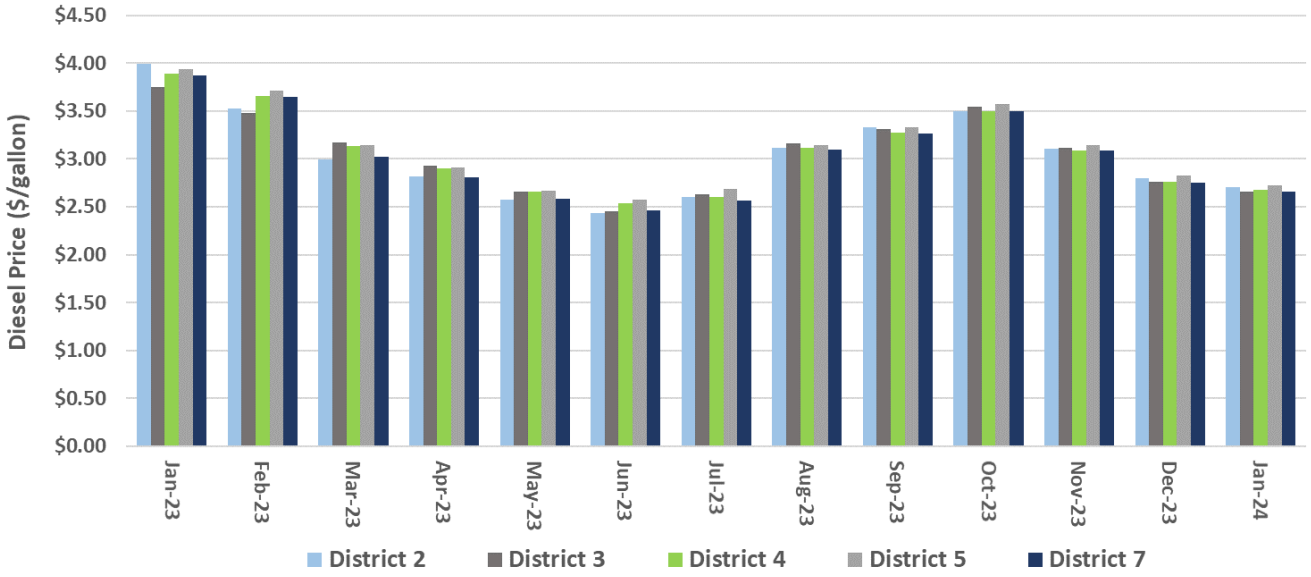
Diesel price quotes from suppliers at terminals around the state averaged $2.68 per gallon in January 2024, which is a 31% decline year-over-year (**Figure 5**). Prices in all districts declined rapidly and with similar extents after the significant increase seen between August-October 2023. Statewide, the Fuel and Bituminous Average Price Index for diesel decreased 3% in January 2024 compared to the previous month and prices were down 31% year-over-year.

Figure 4. Monthly Crude Oil Price, 2017 to 2025



Source: EIA Annual Energy Outlook and Short-term Forecast.

Figure 5. Average Diesel Price by District



Source: FDOT, TBG Work Product (D1 and D6 terminals did not report data).

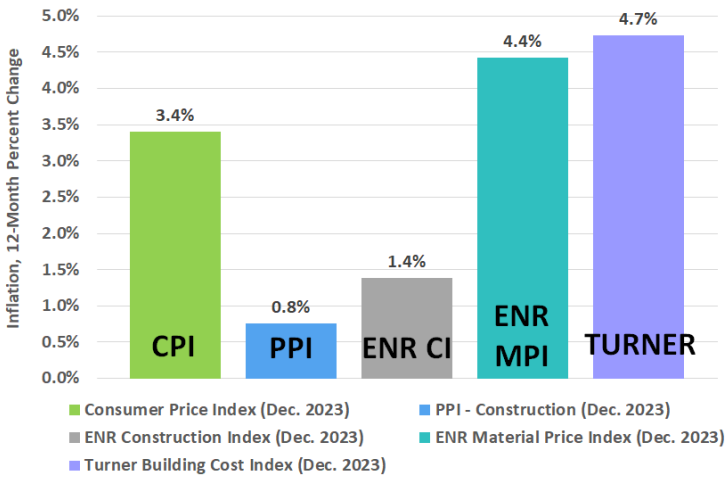
Inflation

U.S. inflation improved slightly in December 2023, with the overall Consumer Price Index (CPI) falling to 3.4%. Core CPI, which excludes food and energy price volatility, declined to 3.9% in December 2023, down from 5.7% during the same month in 2022. The Federal Reserve increased interest rates to 5.5% at the end of calendar year 2023 and, according to industry reports, is expected to keep rates the same during the first few months of 2024 in an effort to ensure the U.S. inflation target rate of 2% comes to fruition.

According to Freddie Mac, 30-year fixed mortgage rates fell from a peak of 7.8% in October 2023 to 6.6% in January 2024. Recent housing forecasts predict mortgage rates could decrease by about 1% by the end of calendar year 2024. While housing starts have slowed down in much of the country over the last year, declining mortgage rates could reverse the trend by year-end and increase competition for workers and other construction resources in 2025.

The Federal Open Market Committee (FOMC) released revised economic projections in December 2023, increasing calendar year-end 2023 Gross Domestic Product (GDP) estimates from 2.1% growth (reported in October) to 2.6%. December 2023 inflation estimates fell to 3.2%, down from 3.7% last quarter. Inflation estimates for 2024 and 2025 were 2.4% and 2.2%, respectively. Other inflation indices ranged between 0.8% to 4.7% last quarter (**Figure 6**). It is important to note that the Engineering News Record (ENR) indices shown include housing-related materials such as lumber, and as a result are not fully reflective of highway construction materials price trends.

Figure 6. Inflation Estimates



Source: BLS, U.S. Census, ENR.

Funding and Regulation

State and federal funding and regulatory changes are expected to increase demand for, or otherwise impact highway construction materials resources:

LEAD AND COPPER RULE IMPROVEMENTS

In November 2023, the U.S. Environmental Protection Agency (EPA) proposed a new rule that would require all lead service lines to be replaced with 10 years. This is relevant as it is expected the demand for PVC pipes will increase as a result.

POLLUTANT DISCHARGE PERMITTING

In November 2023, the EPA published a draft guidance in relation to national pollutant discharge elimination system (NPDES) permits. In particular, the information needed to determine whether a discharge through groundwater required a NPDES permit. The American Road & Transportation

Builders Association submitted comments against the guidance arguing it's unclear, doesn't account for important factors and expands EPA's authority.

PROJECT LABOR AGREEMENTS

In December 2023 the Biden Administration announced the final rule that requires Project Labor Agreements for federal construction projects that cost more than $35 million. Additionally, in January 2024 the Department of Labor published the final rule on employee or independent contractor determination under the Fair Labor Standards Act. The rule goes into effect in March 2024. These two could change costs for producers and contractors. The Associated General Contractors of America (AGC) filed a federal suit to block the project labor agreements rule.

FLORIDA STEEL REQUIREMENT LEGISLATION

SB 674 intends that government entities require iron or steel products be produced in the U.S. for public works projects. Similar to the Federal Buy American and Build America, Buy America Acts (BABA), this legislation would have certain exceptions in relation to availability and costs. The bill currently is in fiscal policy. Currently, projects without federal funding can use imported steel.

EDUCATION LEGISLATION

Among other things, FL SB 460 would allow 16- and 17-year olds to work in construction as long as the minor has an Occupational Safety and Health Administration 10 certification, and is supervised by an individual over 21 with that certification and has at least 2 years of relevant experience. Bill is currently on Appropriations Committee on Education.

MINING LEGISLATION

FL SB 198 aims to set a ground vibration limit of 0.15 inches per second for construction materials mining activities within one mile of residential zones. No further actions beyond introduction have occurred.

INFLATION REDUCTION ACT FUNDING

The U.S. General Services Administration announced funding for 153 low-embodied carbon (LEC) projects. In total, there will be $384 million spent on 81 projects with LEC asphalt, $767 million with concrete and $388 million with steel, both across 101 projects. There's one project in Florida (Orlando) that will use LEC asphalt and concrete. Additionally, the Concrete and Asphalt Innovation Act of 2023 was introduced to the Senate. The bill aims to strengthen and reduce emissions from these products through research programs.

CONTINUING CONTRACTS

FL SB 656 would increase the maximum amount of construction cost projects for which government entities can enter into continuing contracts. Additionally, for geotechnical and materials testing continuing contracts, it requires FDOT to use at least three (no more than five) firms and assign testing on a rotational and equitable basis.

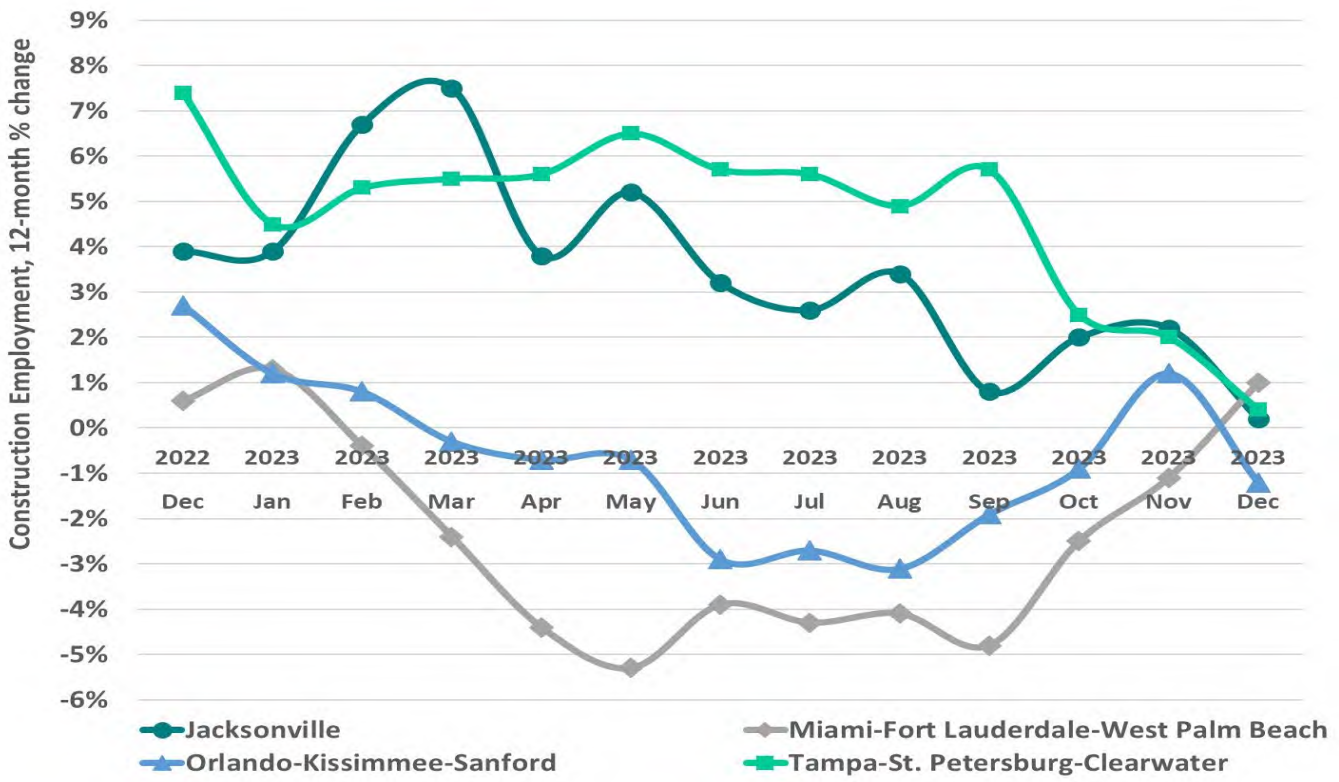
CDL TESTING EXEMPTION

In December 2023, the Florida Department of Highway Safety and Motor Vehicles (FLHSMV) requested the Federal Motor Carrier Safety Administration an exemption to the rule that requires the three parts of the commercial driver license (CDL) skills test to be completed consecutively. The exemption would allow the test to continue when the applicant fails the pre-trip inspection or basic vehicle controls parts. Then, the applicant can come back to retake the failed segment.

Construction Employment

Statewide construction employment growth was 1.6% in December 2023 compared to the same month last year (**Figure 7**). The trend in metro area construction employment activity shifted from what was seen in previous months. In December 2023, all areas converged around -1% to 1% year-over-year rates. Tampa and Jacksonville growth declined after nearly a year of high growth rates, while the Orlando metro area was the only metro with employment losses in December. On the other hand, the Miami metro area continued with the rebound seen since September 2023. In November 2023, statewide average hourly wages of production and nonsupervisory employees for construction and highway, street, and bridge construction, were 5% higher year-over-year.

Figure 7. Changes in Construction Employment in Major Florida Markets, Dec. 2022 – Dec. 2023



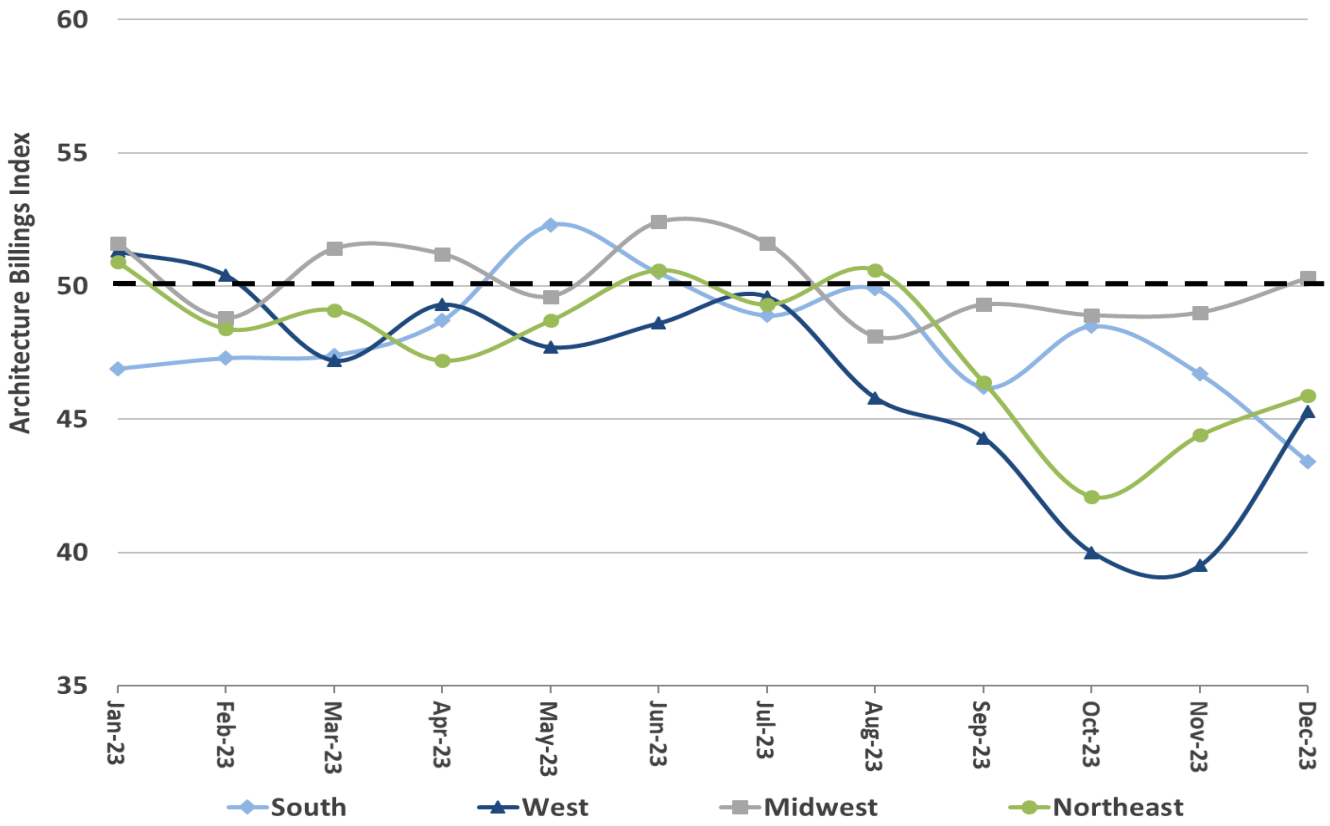
Source: Bureau of Labor Statistics.

In AGC's 2024 construction outlook survey, 39% of construction firm in Florida indicated that it will continue to be hard to hire, 15% indicated that it will be harder, and only 9% indicated that it will become easier. Additionally, the top three concerns for 2024 are all labor related. 74% of respondents indicated rising direct labor costs and insufficient worker supply as the top two concerns, followed by worker quality in third (68%). In regards to pay, 56% indicated that they increased pay rates more in 2023 than in 2022 and 41% introduced or increased incentives. All these are an indication of labor issues that producers have experienced for a while.

Billings

The Architecture Billings Index (ABI) is a leading indicator for nonresidential construction activity. [1] Nationally, the index was 45.4 in December, indicating that a majority of architecture firms saw decreased billings at their firms (**Figure 8**). Most regions saw decreased billings in most months of calendar year 2023, highlighting how some sectors have weakened as the year progressed. In December 2023, only the Midwest region saw increased billings, while conditions in the South region continued deteriorating.

Figure 8. ABI Billings Index, Jan. 2023 – Dec. 2023



Source: American Institute of Architects, Architecture Billings Index

[1] ABI Billings are considered a leading indicator, meaning that construction activity 9-12 months from now generally follows the current ABI billings activity. A score below 50 indicates declining firm billings.

Rail

The rate at which CSX's employee counts increased, slowed down at the end of 2023. In December 2023, the company had 7,869 train and engine employees, a 3% increase year-over-year. In regards to operating performance, average terminal dwell time (between November and January 2024) in Jacksonville increased 10% year-over-year to 22 hours and 4% year-over-year in Waycross, GA to 26 hours. [2] The overall system dwell time during the same timeframe declined 4% to 20.6 hours. So, while Jacksonville's dwell time are comparable to the overall, they haven't improved year-over-year. Delays in Waycross continue being consistently higher. Higher dwell times means that it takes more time to get material out of the station, which could lead to project delays.

On September 7th, the Surface Transportation Board (STB) issued a notice of proposed rulemaking in reciprocal switching for inadequate service issues. The comment period ended in December 2023. The Florida Gulf & Atlantic Railroad and Seminole Gulf Railway received federal funding from the Rail Infrastructure and Safety Improvement Program for track improvements to increase efficiency and load carrying capacity. Additionally, it was reported that Seminole Gulf Railway expected repairs from hurricane Ida would be completed around the end of 2023; updated information was not available at this writing to confirm if this occurred.

In January 2024, the U.S. Department of Transportation (DOT) announced funding for projects under the National Infrastructure Project Assistance (Mega) grant program. One of the projects is $130.5 million for the St. Lucie River railroad bridge replacement project. In addition, FDOT has received a $180 million grant to build new semi-truck parking lots along Interstate 4 in metro Orlando through U.S. DOT's Infrastructure for Rebuilding America program. Four sites are expected to be constructed with a total of 917 parking spaces in Volusia, Seminole, and Osceola counties.

[2] Average amount of time in hours between car arrival to and departure from the yard

WORK PROGRAM: **HIGHWAY CONSTRUCTION**

A summary of FDOT's current Five-year Work Program, including Public-Private Partnership (P3) projects, by Work Mix Type is shown in **Table 1**. The Work Program totals in fiscal year (FY) 2028 reflect approximately $1.5 billion in allocations for Resurfacing and Bridge Repair projects that are not yet programmed.

On the roadway maintenance side, add lanes projects lead projected allocations from FY 2024 to 2028, averaging $2.3 billion. Resurfacing funding is expected to exceed $1 billion in all five work program years. Work Mix Types follow typical allocations, though New Bridge/Bridge Replace project expenditures are expected to increase in FY 2027 for bridge repairs and replacements. Concrete requirements for FDOT are expected to increase substantially in FY 2027 as a result.

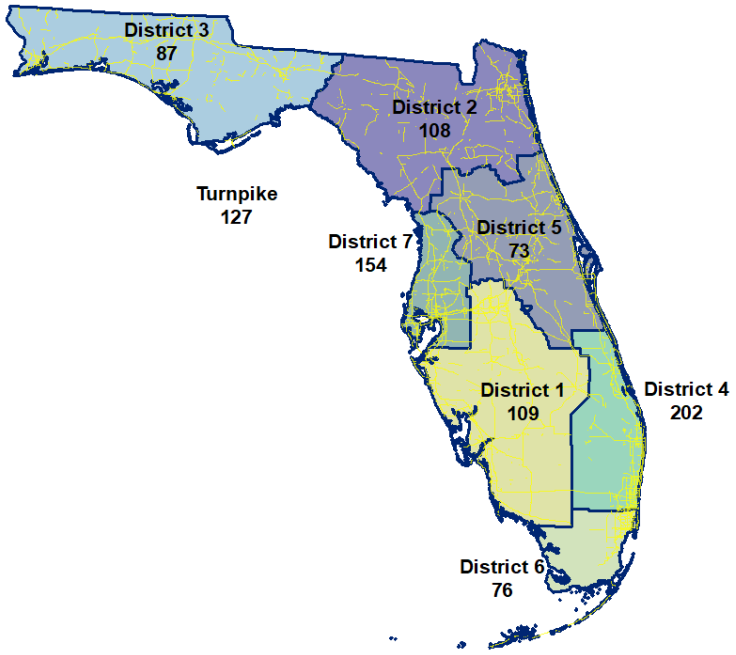
Table 1. Work Program Dollar Allocation by Work Mix Type (in thousands)

Work Mix Type	2024	2025	2026	2027	2028
Add Lanes	$2,966,357,813	$2,279,307,322	$2,940,352,267	$1,828,814,113	$1,659,972,784
Bikepath	$135,327,886	$84,227,815	$51,079,325	$61,053,409	$66,558,534
Bridge Replace/New	$630,585,780	$256,677,650	$676,207,299	$672,919,573	$408,313,891
Drainage	$207,448,871	$31,540,225	$47,840,281	$78,932,611	$32,416,122
Guardrail	$22,656,269	$30,527,435	$15,528,187	$17,143,289	$14,453,458
Interchange	$2,046,640,120	$296,134,050	$113,920,836	$623,309,184	$314,545,940
Intersection	$58,341,973	$116,247,266	$14,245,899	$12,568,000	$112,793,967
ITS	$114,989,001	$45,747,526	$11,290,386	$32,689,534	$25,907,159
Landscaping	$58,857,544	$96,803,138	$80,233,552	$24,817,904	$41,169,725
Miscellaneous	$308,604,850	$112,489,991	$66,041,211	$43,235,354	$25,511,736
New Road	$42,371,048	$1,193,993,525	$257,547,281	$95,361,192	$33,205,029
Resurfacing	$1,569,159,022	$1,778,301,868	$1,516,379,164	$1,443,027,360	$1,368,918,880
Rigidpave	$35,116,509	$76,348,112	$41,408,279	$44,683,218	$44,340,589
Signing/Pavement Markings	$13,647,720	$4,180,600	$6,976,872	$1,000,000	$3,128,000
Toll Plaza	$94,000,572	$18,854,739	$63,665,974	$38,327,852	$14,279,894
Traff Ops	$59,254,529	$63,018,005	$53,685,983	$24,446,083	$35,065,145
Widen/Resurface	$39,376,748	$0	$0	$5,763,530	$1,251,808
Total Work Program	$8,402,736,255	$6,484,399,267	$5,956,402,796	$5,048,092,206	$4,201,832,661

Source: TBG calculated from data provided by FDOT Office of the Work Program and Budget.

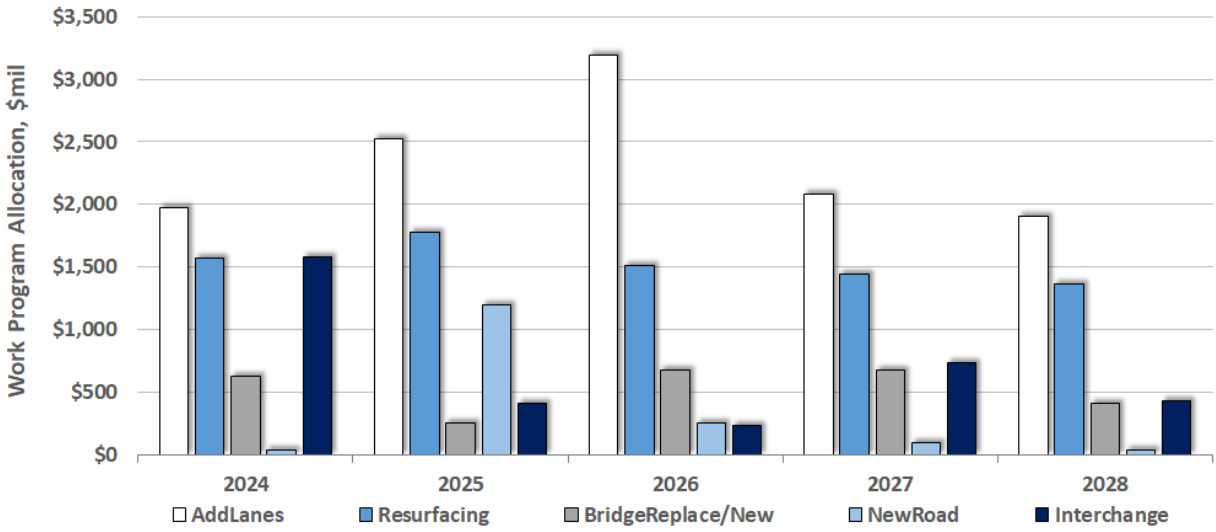
Figure 9 shows projects identified by the FDOT Five-year Work Program and bridge counts derived from Work Program data by district. **Figure 10** provides a comparison by Work Mix type of allocated work program funds for major projects over the five-year work program.

Figure 9. Work Program Bridges Count Estimates by District



Source: TBG calculated from data provided by FDOT Office of Program Management

Figure 10. Work Program Allocation by Work Mix Type, Average Allocation > $250 million



Source: TBG calculated from data provided by FDOT Office of the Work Program and Budget.

Estimates of Future Quantities

Materials quantity estimates are provided in **Table 2**. Work Program funding for five large projects (greater than $250 million) were spread evenly between FY 2024 to FY 2028 to avoid potential overestimation of quantities in FY 2024 and underestimation in later years. Without separating the funds, FY 2024 would have been front-loaded at $8.3 billion.

Table 2. FDOT Future Material Requirements

Material	Units	2024	2025	2026	2027	2028
FDOT Work Program[3]	$ millions	$6,881	$6,753	$6,242	$5,389	$4,526
Asphalt	000s TN	6,175	7,218	6,842	5,962	6,268
Structural Concrete	000s CY	1,641	682	1,785	1,808	1,265
Ancillary Concrete		987	1,067	998	929	761
Total Concrete		2,628	1,749	2,783	2,738	2,026
Reinforcing Steel	TNs	19,999	18,875	16,774	13,925	11,247
Structural Steel		25,093	23,682	21,046	17,472	14,111
Other Steel		127,597	120,422	107,022	88,845	71,753
Total Steel		172,689	162,978	144,842	120,242	97,111
Base Material/Other Aggregate	000s TN	2,841	3,137	3,286	2,568	2,481
Aggregate for Asphalt[4]		4,452	5,100	4,734	4,082	4,246
Aggregate for Concrete		3,601	2,397	3,813	3,752	2,776
Total Aggregate		10,893	10,634	11,833	10,402	9,504

Source: Calculated by TBG, from FDOT Work Program & Estimates data.

Based on data from current year lab volumes received for testing by FDOT and producer interviews, estimates of likely scenarios for binder demand were prepared. **Table 3** provides a breakdown by type of binder demand for the five-year work program.

Table 3. FDOT Future Requirements of Asphalt Binder

Asphalt Binder (Tons)	2024	2025	2026	2027	2028
PG 52-28	33,160	40,344	38,990	31,362	30,911
PG 58-22	50,385	60,479	58,075	47,992	48,395
PG 67-22	4,488	5,246	4,973	4,333	4,556
PG 76-22 (PMA)	169,549	191,867	178,862	159,777	170,724
High Polymer	13,059	18,429	18,967	17,834	20,123

Source: Calculated by TBG, from FDOT Work Program & Estimates and SMO data.

[3] Excluding landscaping. Refer to **Table 4** for landscaping allocations.

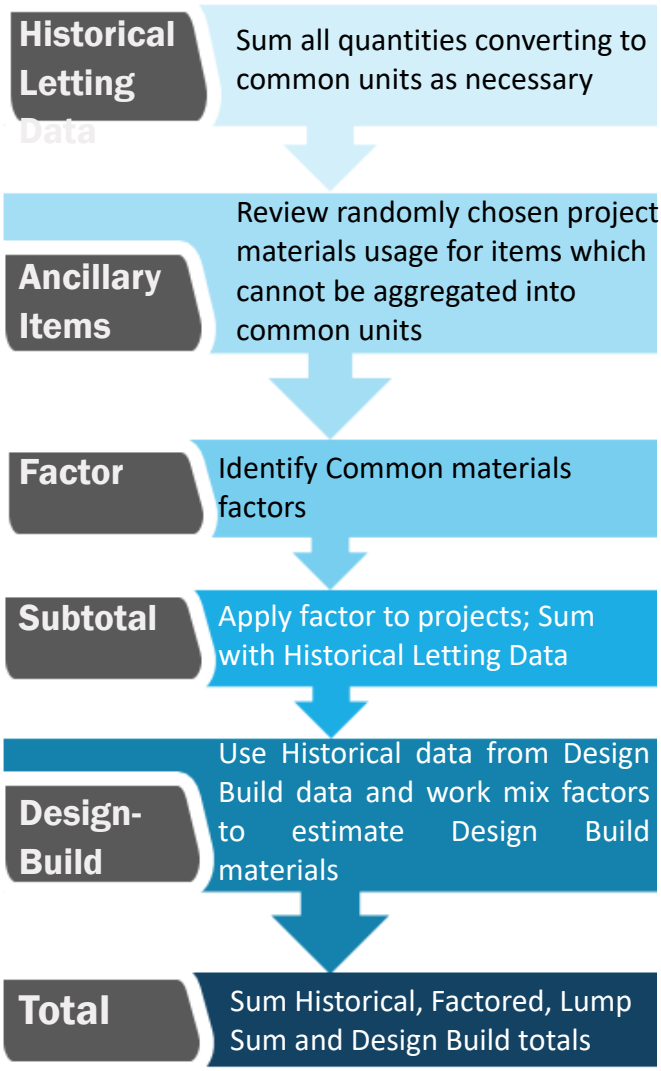
[4] The latest FDOT data shows that reclaimed asphalt pavement (RAP) usage has increased to about 22% of total asphalt as of fiscal year 2023. The share of aggregate in asphalt is 75% and binder is about 4%. This analysis assumes that RAP usage will continue to increase by 1-2% annually over the next few years due to aggregate shortages and higher prices.

FDOT Data

Future quantities are estimated for the five-year work program (**Figure 11**). Historical Lettings and Long Range Estimates (LRE) data are received from the FDOT Offices of Work Program and Budget and Program Management/Estimates. Historical Lettings data contains pay item level lettings data from July 2009 through December 2023 (FDOT fiscal years Q1 2010 – Q2 2024) and LRE pay-item level data from July 2023 through June 2028 (fiscal years 2024 – 2028). FDOT Work Program and P3 data was received from the Office of Work Program and includes 2,559 unique projects.

Quantities are estimated using a factor approach. The factors were calculated by Balmoral economists and roadway engineers after evaluating several statistical relationships, including historical share of dollars spent for different project types, length of project and other variables depending on work mix type. The factors were originally created in 2007 from pay item data and most recently updated using pay item data through the end of 2023 for the current study.

Figure 11. Basis of Calculations



Raw Five-year Work Program data includes work mix level dollars for Fiscal Years 2024 – 2028. LRE data provided to Balmoral contains 1,520 unique projects. LRE price estimates for 2024 through 2028 were based on project types and used in conjunction with Work Program dollars to estimate future material quantities.

ASPHALT

Summary

- Binder prices were 6% lower year-over-year, but had only marginal declines for the last few months.
- For calendar year 2024 producers expect similar conditions to 2023, with infrastructure spending being the primary driver of demand.
- Asphalt producers continue reporting issues with labor and aggregate. However, the Port of Tampa approved a new lease for aggregate imports.

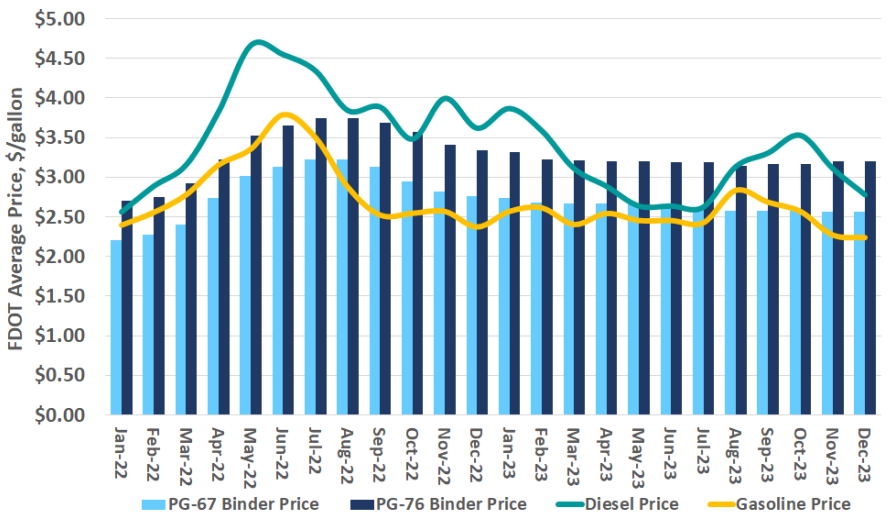
FDOT Impacts

- High infrastructure demand is expected to keep asphalt bids high in FY 2024.
- During the first six months of FY 2024, FDOT Hot Mix Asphalt (HMA) weighted average bid prices were 11.4% higher than fiscal year-end 2023 prices.
- Asphalt cost projections are tracking within 1% of the best estimate for FY 2024.

General Trends

FDOT diesel fuel prices declined significantly in December 2023, dropping 21% from October 2023 highs (**Figure 12**). Similarly, gasoline prices fell 13% over the same period. Asphalt binder prices, on the other hand, were little changed over the last quarter. While binder prices have moderated in recent months, current pricing is still more than 50% higher than 2019 levels. Through October 2023, U.S. refinery net production of asphalt and product supplied (a proxy for consumption) of asphalt and road oil declined 2% in both cases. However, product supplied in the east coast was up 2%. The industry expects a flat 2024 with demand driven by infrastructure funding. However, the American Road and Transportation Builders Association (ARTBA) expects the public highway, pavement, and street construction sector in the U.S. to grow 16% as more projects under the Infrastructure Investment and Jobs Act enter the construction phase. These conditions continue supporting higher prices.

Figure 12. FDOT Fuel and Asphalt Binder Prices, Jan. 2022 – Dec. 2023



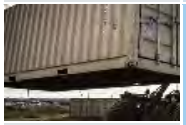
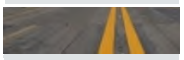
Source: Source: TBG Work Product, FDOT Fuel & Bits Index.

↑	Exerting negative influence on FDOT's costs; monitor.
=	Currently stable; not influencing FDOT's costs.
↓	Exerting positive influence on FDOT's costs.

SUPPLY CHAIN VARIABLES: **ASPHALT PAVEMENT MATERIALS**

Table 4 provides the current status of selected variables of interest.

Table 4. Supply Chain Summary: Asphalt Materials

 Aggregate	The U.S. Geological Survey (USGS) reported that Florida's crushed stone production decreased 1% during the third quarter of calendar year 2023 and was flat year-to-date. Nationally, production declined 3% in the quarter and 1% year-to-date. Prices continued with double digit increases. For calendar year 2024, the aggregate industry expects similar conditions to 2023, with some moderation in price increases. In October 2023, the Port of Tampa Bay approved a 10-year lease (with options to be extended) for Ajax Paving to import liquid asphalt, limestone, granite and crushed concrete. Interviews continue indicating that availability and prices of aggregate is a common issue.	↑
 Refinery Capacity	Refinery utilization in the Gulf Coast was between 85% - 95% in calendar year 2023. Costs and prices will continue to be affected by geopolitical factors. For instance, more countries joined Saudi Arabia and Russia with additional voluntary production cuts through March 2024, bringing the total to 2.2 million barrel per day. There are some concerns for the second half of calendar year 2024 on the supply of heavy crudes to refiners. The trans mountain expansion pipeline in Canada is expected to begin service this year, so it's possible that some product that usually goes to the Midwest/Gulf Coast may head to the Pacific instead. Also, Pemex is starting up a new oil refinery, so it's expected that Mexican imports will decline as the country becomes more self-reliant by 2025. This could limit supply and increase the use of asphalt as fuel blendstock; industry is uncertain whether this will materially impact asphalt prices. On January 30th, the State Department announced the U.S. won't extended sanction relief to Venezuela's oil sector beyond April 2024. Additionally, the U.S. EPA proposed a new waste emissions charge to the oil and gas sector that would impose fines for methane emissions exceeding a predetermined level. Industry argues this will be hard to implement and raise production costs.	↑
 Asphalt Binder	Record high binder prices are still impacting FDOT asphalt costs. Unmodified (PG 67 & lower) asphalt binder prices had been relatively unchanged since September 2023. In January 2024, prices finally declined 6%, year-over-year. Rack binder prices in Jacksonville, Miami and Tampa declined 3%, 2% and 8% year-over-year, respectively. Global oil supply-demand dynamics haven't affected prices so far since imports have been significantly lower in recent years.	↑
 Polymers	U.S. production of resins increased 12% in November 2023 vs. November 2022. Year-to-date production increased 3.4% year-over-year, according to the American Chemistry Council (ACC). ACC's quarterly Chemical Manufacturing Economic Sentiment Index showed flat growth for domestic new orders, lower volume of order backlogs as well as lower supplier delivery times. No new capacity is expected to come online in 2024 and producers in the industry believe that demand won't recover until interest rates are lower. These factors benefit asphalt producers as they lower costs, but could affect supply in the long-term. Interviews indicated no issues with availability and prices have decreased.	↓
 Imports	Data from the U.S. International Trade Commission shows that imports of bitumen products to ports that service Florida markets fell 15% in calendar year 2023 through November. Cargo from Spain arrived in Miami in November 2023. Forced shipping reroutes in the Red Sea are not expected to affect FDOT costs. However, the more producers are able to find product locally, the less exposed they are to issues with international freight. Additionally, sanctions lifted on Venezuela's oil production and imports have seen limited interest due to continued uncertainty of that market.	=
 Rail	In Q2 of calendar year 2023, tons and revenues of asphalt products shipped by CSX, regardless of the destination, both increased by 17% year-over-year. Compared to previous reports, these indicate some moderation in price increases.	=
 Trucking	Asphalt suppliers continue facing issues with trucking - fuel costs being the major factor. Producers indicated that fuel costs went up early in the quarter, however diesel costs have since decreased in January 2024 by 31%, year-over-year. In an effort to accelerate the CDL process, FLHSMV requested test exemptions from the Federal Motor Carrier Safety Administration in December 2023. FLHSMV indicated the agency received 35,000 applications in the past year.	↑
 Markings	The U.S. Chemical Production Regional Index fell 1% in November 2023, year-over-year. Shipments of coatings and adhesives declined as well. Some companies have reduced rates or shut down due to cold weather, which might cause temporary disruptions in the overall polymer market. Interviews indicated no issues with availability and prices declines.	=
 Labor	Finding skilled labor is an ongoing concern for asphalt plant operators. As mentioned elsewhere, construction firms in Florida expect issues with finding labor to continue in 2024. This was confirmed during interviews, where producers indicated high turnover and difficultly finding new candidates to hire. As mentioned elsewhere in the report, statewide construction employment has slowed down, while hourly wage growth rates continue to increase.	↑
 Competition	Ergon Asphalt & Emulsions, headquartered in Mississippi, completed two transactions during the quarter. They bought the assets of Gardner Asphalt Corporation's asphalt and emulsion terminal in Tampa and Associated Asphalt, which has facilities in Cape Canaveral, Lake City, Jacksonville, Tampa, Port of Manatee and Port Everglades. This consolidation brings a new big company that has presence throughout the state and could alter prices for FDOT projects. No new asphalt plants have been added to FDEP's air permitted facilities that are under construction.	=

Material Quantities

FDOT's HMA Future Requirements were forecasted based on current LRE and Work Program data. HMA Projections are shown in **Table 5**.

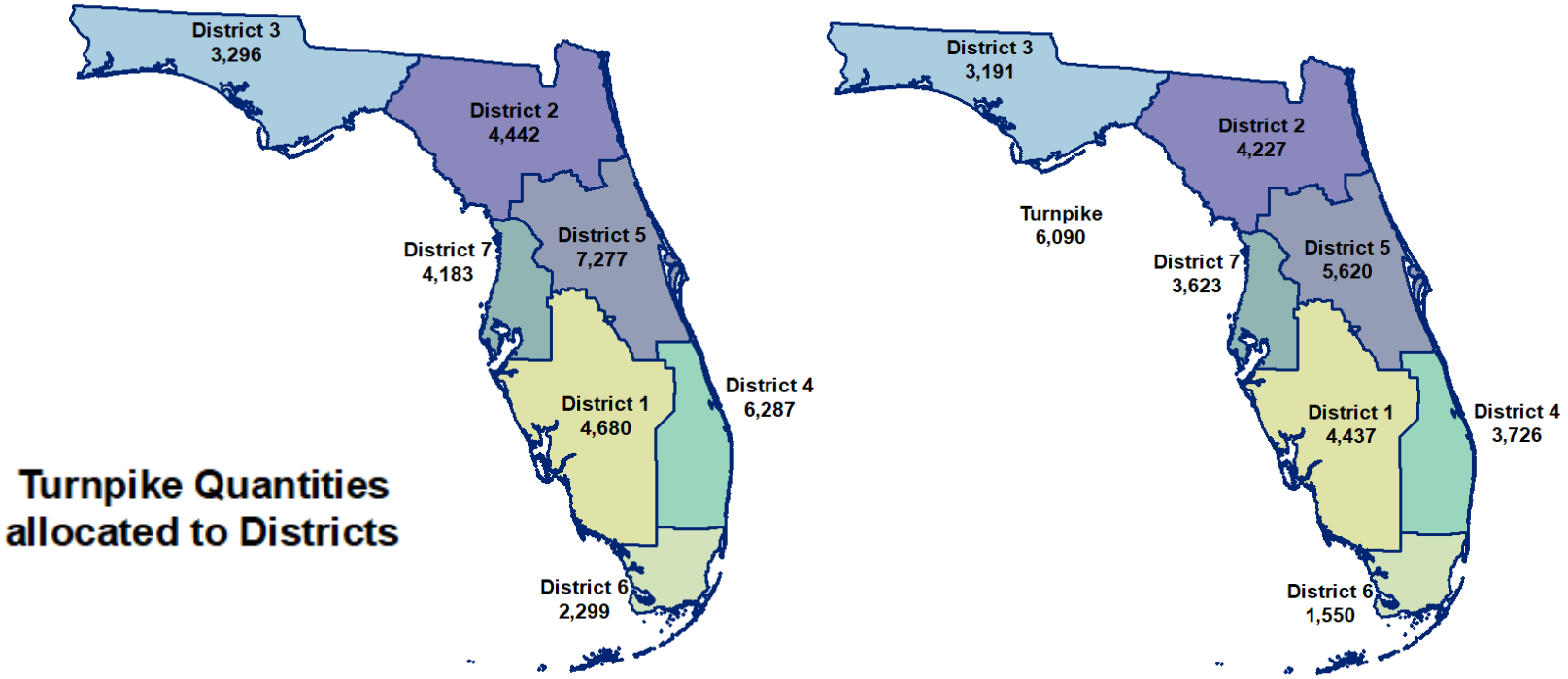
Table 5. FDOT Future Requirements of Hot Mix Asphalt (in thousands)

District	2024	2025	2026	2027	2028
D1	903	597	716	1,511	710
D2	794	974	643	920	896
D3	680	795	729	493	494
D4	732	784	546	697	966
D5	752	1,319	1,939	932	678
D6	449	253	407	240	201
D7	645	888	721	636	733
D8	1,220	1,608	1,139	532	1,590
Total Tons	**6,175**	**7,218**	**6,842**	**5,962**	**6,268**

Source: TBG calculated from data provided by FDOT Office of the Work Program & Budget.

Total asphalt requirements for the Five-year Work Program are shown in **Figure 13** by District, with and without Turnpike allocation. Quantities are estimated using a factor approach as discussed in the FDOT Data section. The factors were calculated by Balmoral economists and roadway engineers after evaluating several statistical relationships, including historical share of dollars spent on HMA for different project types.

Figure 13. Total Asphalt Quantities for Five-year Work Program (000s of Tons)



Source: TBG calculated from data provided by FDOT Office of Program Management.

Asphalt Forecast

Asphalt prices are projected in **Table 6** for the five-year construction work program (December 2023 snapshot). Regression modeling was performed using pay item data, supply chain variables, and other macroeconomic indicators to identify models that best predicted FDOT's materials costs and quantities.

Industry remains uncertain about the impact of global conflicts on crude oil futures, but for the moment, outlooks are optimistic. However, continued high binder prices, which some suppliers attribute to declines in crude oil volumes set aside for binder, FY 2024 asphalt costs increases 1% from the previous forecast. Compared to FY 2023, prices are forecast to end FY 2024 6.3% higher.

With updated housing starts, employment data, economic expectations, and binder prices, the current best estimate expect asphalt prices to remain elevated through the end of the five-year work program. Record high December 2023 FDOT work program funding levels, statewide economic growth, and high input costs are expected to keep bids above historical norms in the through FY 2028.

The much less likely lower bound reflects recession-era crude prices and further constraints on construction employment. According to recent industry survey, only 9% of economists currently predict recessionary conditions occurring in 2024.[5] The upper bound is supported by a high crude projection, continued Florida macroeconomic growth, and significant supply chain disruption, such as major weather events, war, or other geopolitical conflicts. **Figure 14** shows the potential range of estimates over the five-year work program.

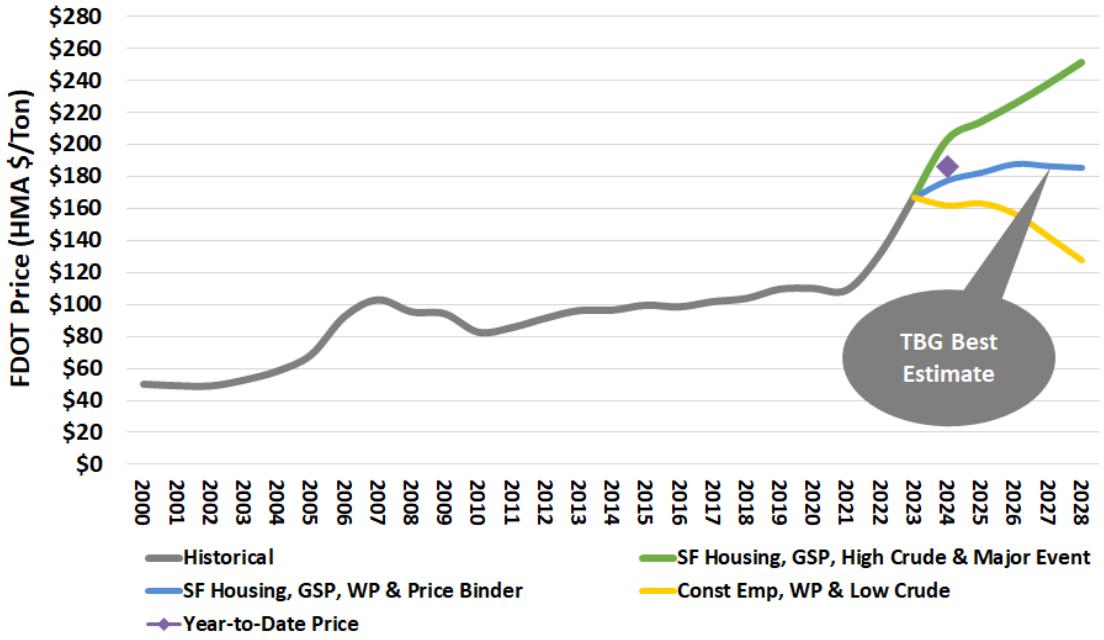
Table 6. FDOT HMA Price Forecast Results

Fiscal Year	2023	2024	2025	2026	2027	2028
Price HMA, $/Tons	$167.07	$177.55	$182.28	$187.53	$186.32	$185.25
Annual Percent Change, %	26.6%	6.3%	2.7%	2.9%	-0.6%	-0.6%

Source: TBG calculated from data provided by FDOT Estimates Office, various industry sources.

[5] NABE January 2024 Business Conditions Survey.

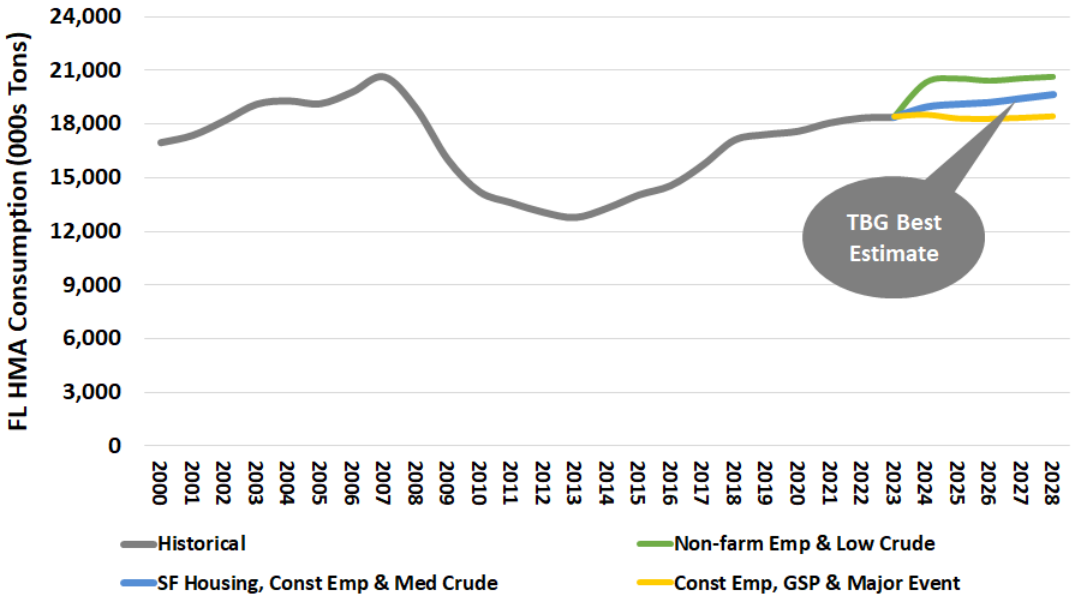
Figure 14. FDOT HMA Price, FY 2024 Q2 Forecast



Source: TBG calculated from data provided by FDOT Estimates Office, various industry sources.
(Variable descriptions available in the **Appendix**.)

Figure 15 provides a forecast of Florida HMA consumption. The best estimate assumes shows a stable incline in production through FY 2028 with moderate employment and housing start growth and medium crude oil price projections. The lower bound requires recessionary conditions, which are unlikely at this writing. The upper bound is based on a positive labor outlook and significantly lower fuel costs that would allow for additional production.

Figure 15. Florida HMA Consumption, FY 2024 Q2 Forecast



Source: TBG calculated from data provided by FDOT Estimates Office, various industry sources.

CONCRETE

Summary

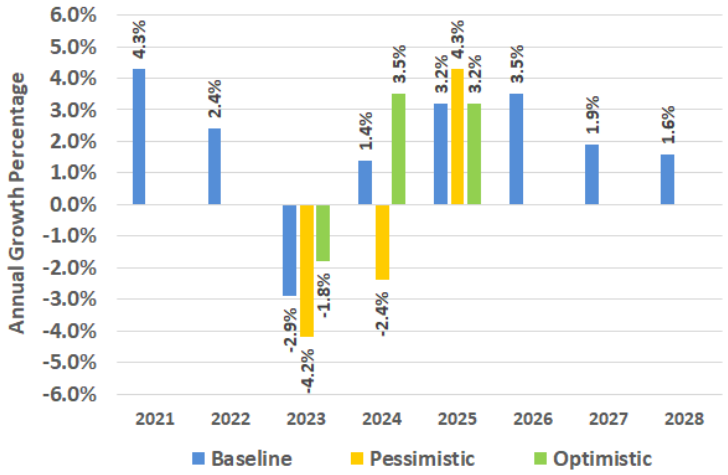
- Year-over-year, production continued declining, while reported price increases were as high as 30%. Similarly, to other materials, expectations are a similar 2024 with moderation in price increases. Cement consumption was reportedly down in 2023 according to Portland Cement Association (PCA), but prices were supported by high levels of infrastructure spending.
- According to newly available data, fly ash production in 2022 rose 1%, but the percent that was re-used declined by 10%. However, producers didn't indicate that fly ash availability has worsened.
- Labor, trucking and aggregate costs were the main issues highlighted by producers during the quarter.

FDOT Impacts

- Weighted average concrete prices were up 16.4% through the second quarter of FY 2024 compared to fiscal year-end 2023 costs.
- Producers continue indicating that they are passing off costs increases to customers. Steep aggregate price increases, along with ongoing labor constraints, are affecting bottom lines and keeping bids high.
- Current bids are tracking within 3% of the forecasted best estimate of FY 2024 structural concrete prices. A decrease in concrete pricing is not expected at this time.

General Trends

Figure 16. PCA Fall 2023 Cement Consumption Outlook



Source: Portland Cement Association (PCA).

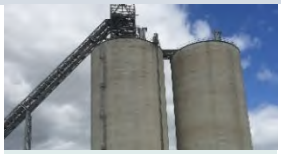
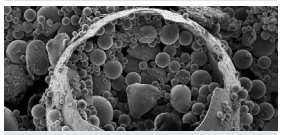
World of Cement predicts that demand for cement will increase 2-3% in calendar year 2024, largely fueled by public works. So far funding from the infrastructure bill has largely gone to water and sewer projects already slated in state revolving funds, but it is believed that this money will start working its way into other types of projects with funding peaking from 2024-2026. PCA expects the U.S. economy to weaken during the first half of 2024, but predicts it will slowly recover in the second half of the year. PCA's baseline prediction for U.S. cement consumption is slightly lower at 1.4%. **Figure 16** shows PCA's 2023 fall cement consumption outlook and gives their baseline, pessimistic, and optimistic forecasts for select years. Another industry report sees revenue growth for 2024 to be around 2.5% as the residential sector is only expected to recover once the Fed starts reducing rates. As expected, prices also continued increasing during the quarter.

Exerting negative influence on FDOT's costs; monitor.
Currently stable; not influencing FDOT's costs.
Exerting positive influence on FDOT's costs.

SUPPLY CHAIN VARIABLES: **CONCRETE MATERIALS**

Table 7 provides an overview of supply chain variables and a summary of their current status; items with current issues are further detailed in the subsequent text.

Table 7. Structural Concrete Supply Chain Variables & Current Status

 Cement	During Q3 of calendar year 2023, publicly traded companies continued reporting a slowdown in volumes, but not pricing. Year-over-year, prices increased between 10% and 19%, while volumes were flat or declined as much as 13%. Companies highlighted a softening in many sectors, but not for infrastructure. For reference, Cemex indicated that "in response to the demand environment, we have reduced cement imports to support margins."[6] Interviews indicated higher price increases, ranging between 10%-30%. Price increases in calendar year 2024 are still expected. Producers still pass on some of the costs to customers. Demand for cement is expected to rise by 3% driven by infrastructure spending. Additionally, the French Hoffmann Green Cement Technologies announced a licensing deal with an undisclosed partner in the U.S. to build several plants in Florida that can produce clinker-free cement in the State. Deal is expected to be signed on March 31st, 2024.	↑
 Aggregate	Interviews indicated that aggregate availability, increased pricing, and transportation availability and costs continue causing issues for the industry. Interviews indicated price increases for aggregate on January 1st. General issues are covered in the Aggregate section.	↑
 Fly Ash	No new sources of fly ash have been reported since the last report. The Port of Tampa Bay recently approved a 10-year lease (with options to be extended) to Pangaea Florida to import cementitious products like clinker and fly ash; other products as slag and aggregate materials. According to new data, fly ash produced in the U.S. rose 1% in calendar year 2022. However, the fly ash re-used declined 10%. 65% of the fly ash used was for concrete products and 19% was for feed for clinkers.	↑
 Rail	As with other industries, producers had to deal with rail reliability issues this quarter. However, in Q3 of calendar year 2023, overall tons and revenues of concrete products shipped by CSX increased by 13% and 15% year-over-year, respectively.	↑
 Trucking	Diesel prices have declined and are just above the lows in July of 2023 at $2.63 per gallon in January 2024. Year-over-year, diesel prices are down 31%. Interviews indicated difficulties with driver retention. Exemptions requested by FLHSMV's could speed up CDL test processes if granted; the agency indicated they received 35,000 applications in the past year.	↑
 Labor	Producers continue reporting issues with finding skilled labor, indicating that it hasn't gotten better or worse. As mentioned elsewhere in the report, statewide construction employment has slowed down, while hourly growth rates continue being higher.	↑
 Competition	Summit Materials and Argos USA merger was completed in January 2024. Post-pandemic industry consolidation continues within the realm of civil engineering and material production, which may impact FDOT prices as the competitive pool of firms narrows. On the other side, several structural and non-structural concrete plants were approved or are under review in FDOT's producer list during the quarter. One in District 4 and two in both Districts 3 and 5. Additionally, there are two concrete plants under construction (Tampa and Davenport), one cement terminal in Southport as well as the previously reported plant in the Port of Palm Beach in FDEP's air permitted facilities	↑

[6] Cemex 3Q 2023 report

Material Quantities

Updated estimates of materials quantities for the FDOT work program were prepared using a factor approach. The factors were calculated by Balmoral economists and roadway engineers after evaluating several statistical relationships, including historical share of dollars spent on concrete for different project types.

FDOT Work Program requirements are estimated to average around 2.4 million cubic yards throughout the Five-Year Work Program (**Table 8**). A large uptick in concrete requirements are projected for FY 2024, 2026, and 2027 when several large add lanes and bridge projects begin construction.

Table 8. FDOT Future Concrete Requirements (in thousands)

Year	2024	2025	2026	2027	2028
Structural Concrete	1,641	682	1,785	1,808	1,265
Ancillary Concrete	987	1,067	998	929	761
Total Cubic Yards	2,628	1,749	2,783	2,738	2,026

Source: TBG calculated from data provided by FDOT Office of the Work Program Budget.

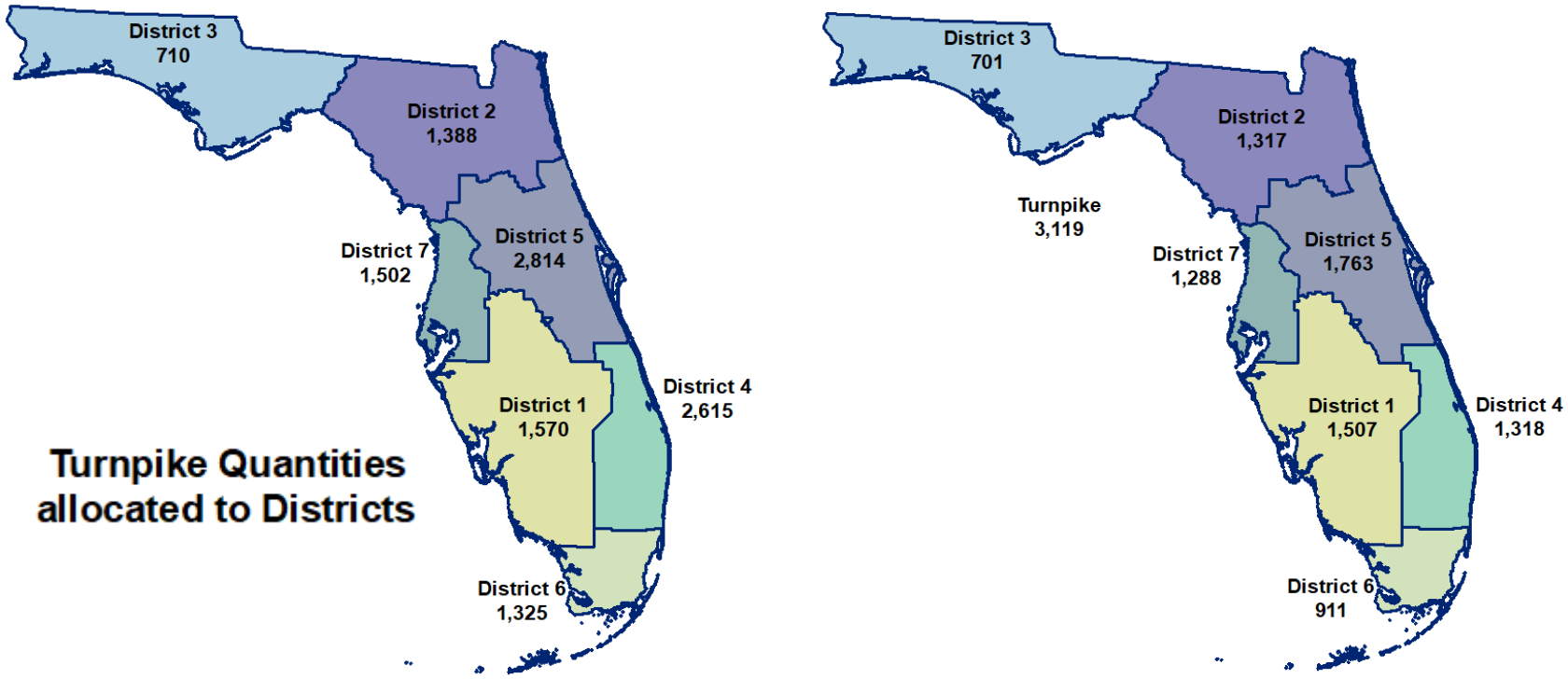
Table 9 shows future FDOT concrete requirements by District. Differences in demand by District are reflected in pricing. **Figure 17** shows the distribution of materials requirements for the entire Five-year Work Program by District.

Table 9. FDOT Future Concrete Requirements by District (in thousands)

District	2024	2025	2026	2027	2028
D1	358	52	186	823	88
D2	124	264	266	316	347
D3	330	52	172	118	29
D4	295	195	262	356	210
D5	321	242	750	311	140
D6	331	35	233	259	53
D7	260	219	258	178	373
D8	609	690	657	376	787
Total Cubic Yards	2,628	1,749	2,783	2,738	2,026

Source: TBG calculated from data provided by FDOT Office of the Work Program Budget.

Figure 17. Total Concrete Quantities for Five-year Work Program (000s Cubic Yards)



Source: TBG calculated from data provided by FDOT Office of Program Management.

Concrete Forecast

Regression modeling was performed using pay item data, supply chain variables, and other macroeconomic indicators to identify models that best predicted FDOT's materials costs and quantities. **Table 10** provides the updated forecast average price for concrete. The current forecast is within 4% of previous estimates and is tracking just under year-to-date bid results. The best estimate of concrete prices reflects the impact of ongoing skilled labor constraints, economic growth, work program demand, aggregate costs, and crude oil prices (**Figure 18**). A lower bound reverts to FY 2023 levels (note that pre-pandemic conditions are no longer projected in this scenario), with declines in construction labor, lower Florida macroeconomic activity, and diesel prices. The upper bound reflects construction employment growth, improving economic conditions, and higher crude prices.

Table 10. FDOT Concrete Price Forecast Results

Fiscal Year	2023	2024	2025	2026	2027	2028
Price Concrete, $/CY	$1,206	$1,340	$1,384	$1,415	$1,427	$1,440
Annual Percent Change, %	45.3%	11.1%	3.3%	2.3%	0.8%	0.9%

Source: TBG calculated from data provided by FDOT Estimates Office, various industry sources.

Figure 18. FDOT Concrete Price, FY 2024 Q2 Forecast

Source: TBG calculated from data provided by FDOT Estimates Office, various industry sources.
(Variable descriptions available in the **Appendix**.)

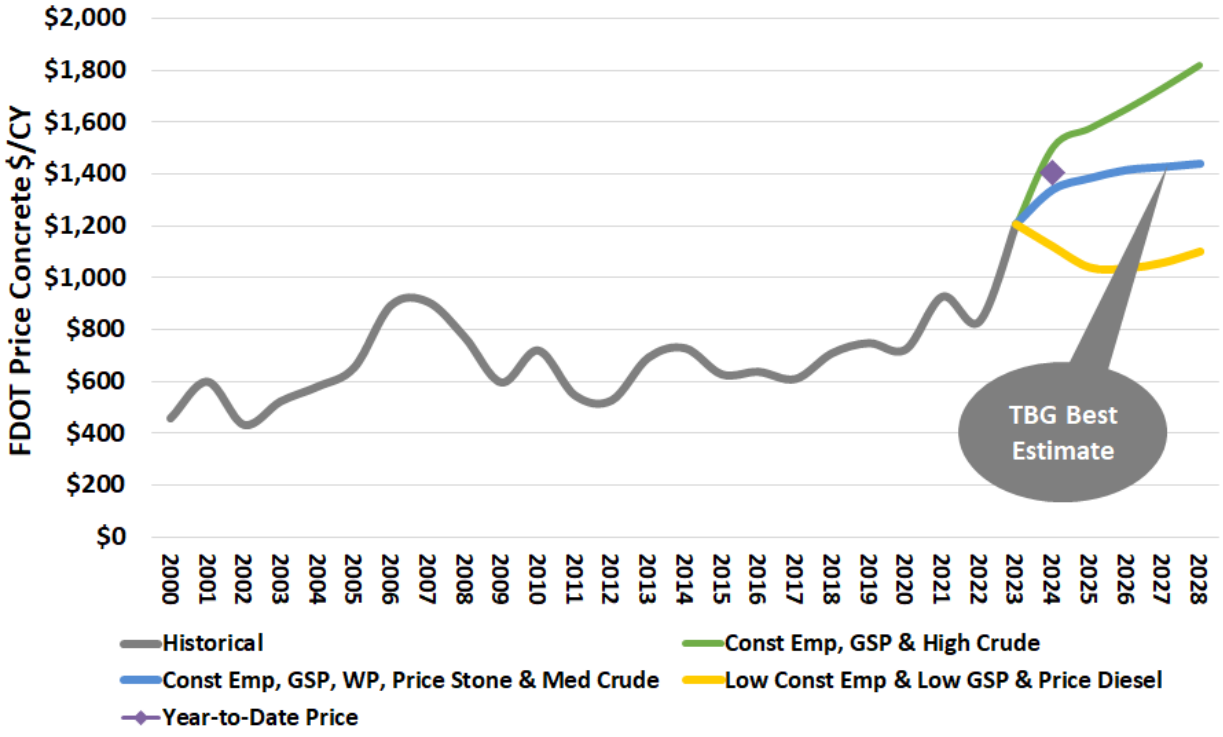
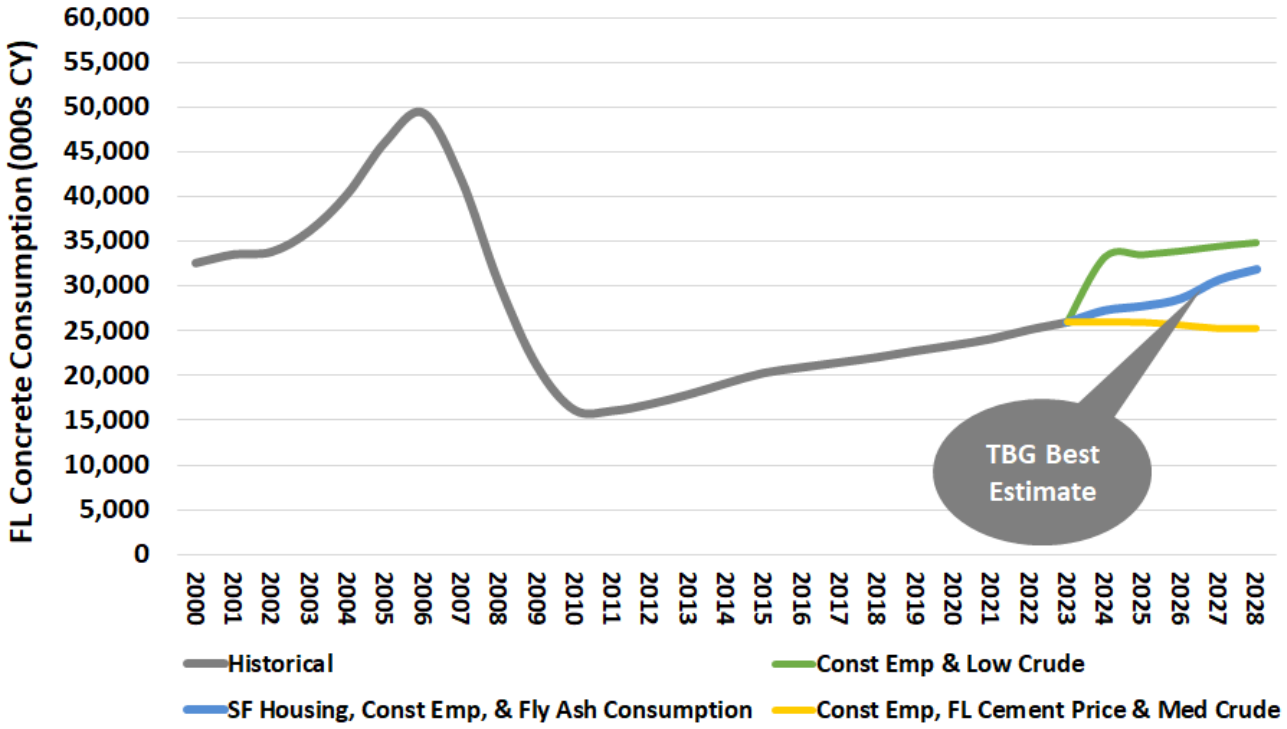


Figure 19 shows the output of several quantity models forecasting statewide consumption of concrete and the scenario identified as the best estimate. The best estimate tracks housing, construction employment, and fly ash consumption. The upper bound would require drastic drops in crude oil costs and construction employment growth. Flat conditions are shown in the lower bound.

Figure 19. Florida Concrete Consumption, FY 2024 Q2 Forecast



Source: TBG calculated from data provided by FDOT Estimates Office, various industry sources.
(Variable descriptions available in the **Appendix**.)

STEEL

Summary

- U.S. steel prices increased late in calendar year 2023, but were lower year-over-year. However, producers reported that prices have improved overall.
- Raw steel production was flat in calendar year 2023 and capacity utilization was in the mid-70s percent. New capacity is expected to come online in 2024.
- The news of U.S. Steel's acquisition received pushback from legislators and unions. This consolidation could significantly change competition within the steel industry.

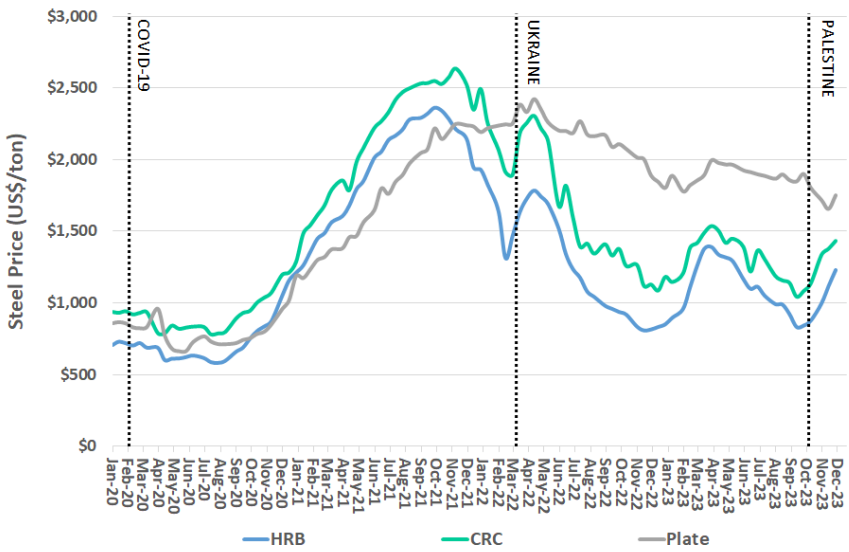
FDOT Impacts

- Structural steel bids are up 15.7% through the second quarter of FY 2024 compared to FY 2023 (based on limited bids). Forecasts predict a decline back to FY 2023 levels by fiscal year- end, but mills have noticed customers of planned price increases
- Reinforcing steel price increases continue to slow, rising less than 1% so far in FY 2024 compared to FY 2023. Forecasts currently expect a slight decline by fiscal year-end.
- Producers expect prices to increase over the next quarter across multiple products. Some FDOT fabricators report that material supplies are running low and supply is difficult to obtain.

General Trends

U.S. steel prices rebounded once again during the last quarter as war in the Middle Eats broke out, reversing declines from the summer (**Figure 20**). U.S. hot-rolled band prices ended calendar year 2023 52% higher than 2022. Cold-rolled coil prices also rose 35%, year-over-year, while steel plate prices were down 5% in 2023.

Figure 20. U.S. Steel Pricing, Jan. 2020 – Dec. 2023



Source: AISI Weekly Raw Steel Production.

Publicly traded steel companies are expecting increasing prices and an improving domestic market heading into 2024, which will include increasing selling prices, increasing consumer demand and strong order activity. This may result in higher prices for FDOT and more competition for material. Florida producers report similar expectations for 2024 after declines in price occurred in the second half of 2023.

Exerting negative influence on FDOT's costs; monitor.
Currently stable; not influencing FDOT's costs.
Exerting positive influence on FDOT's costs.

SUPPLY CHAIN VARIABLES: **STEEL**

Table 11 shows a summary of select variables that impact the steel supply chain and their current status.

Table 11. Supply Chain Variables for Structural Steel

 Raw Materials	According to the latest data, prices for hot-rolled steel increased 19% in December 2023, year-over-year. Prices increased for most of the first half of the calendar year, declined through September, and then increased through the end of the year. Iron ore prices declined 12% in 2023. Interviews indicated that prices across products have increased and will continue to increase. However, they have seen increases in products like tubing, pipe, bar, and structural angle materials. Some producers have reported issues getting material and longer lead times.	↑
 Scrap Steel	U.S. scrap steel prices increased 11% in January 2024 compared to the same month in 2023. While prices declined through mid-October, they increased through the end of the year. Continued conflicts around the world could cause disruptions in the supply chains and prices for steel and other metals. However, new capacity of electric arc furnaces is this year. Per Argus, more than 13 million short tons per year is expected to start in 2024. This could help producers, as well as FDOT, with prices and lead times. Producers indicate that scrap prices are increasing this quarter compared to last and are expected to increase for 2024.	↑
 Galvanizing	Global zinc prices decreased 24% in calendar year 2023 and 20% in December 2023 compared to the same month in 2022. Interviews indicated similar trends as previous reports with prices and lead times improving. Lead times for poles were reported at about 30 weeks. Contractors indicated attempts to order material as soon as possible to meet deadlines.	↓
 China	As of January 2024, Chinese steel prices declined 4% year-over-year to an average of $555 per ton. However, prices are up from their low in July of 2023 of $475 per ton. Production was up 1.5% for the period from January through November 2023 compared to that same period in 2022.	=
 Transportation	Diesel prices declined in January 2024 and are just above the lows of July 2023 at $2.63 per gallon. Year-over-year, diesel prices are down 31%. Producers indicated that overall trucking costs have increased over the year and they are susceptible to further changes. CDL test exemptions have been requested by FLHSMV to accelerate the processing time.	↑
 Rail	Trucking is the preferred method for transportation of finished product, but raw materials are delivered by rail to some fabricators. Rail updates are explained in more detail elsewhere in the report.	=
 Milling Capacity	Production in calendar year 2023 was relatively unchanged, rising only 0.2% to 88.7 million net tons. Capacity utilization continues in the mid-70s. As of the second week of January 2024, it measured 76.7%. Higher utilization could help FDOT costs, but not in the short-term. It should be noted that with the end of the United Auto strike, mills had to quickly increase production to meet demand.	↑
 Labor	Fabricators continue reporting issues with finding skilled labor, but some (not all) have seen an uptick in people looking for work in recent months. As mentioned elsewhere in the report, statewide construction employment has slowed down, while hourly wage rates continue growing.	↑
 Competition	U.S. steel is expected to be acquired by Japan's Nippon Steel. U.S. Steel executives are not concerned about pushback from U.S. legislators and have said they believe this deal will increase competition in the U.S. Supply and prices will continue to be affected by what happens in other sectors of the economy as well.	↑

Steel Quotes

The most recent request for steel price and production quotes sent to FDOT steel fabricators finds that price changes trended upwards in December 2023 for most materials (**Table 12**). These increases are expected to continue through March 2024. The almost across the board price increases are in line with what many producers are reporting in interviews. However, some have secured lower quotes from smaller, more competitive steel suppliers. Galvanizing and structural steel are expected see the largest price increases according to a small sample of fabricators.

Table 12. January Steel Producer Quotes

Material	Structural Steel	Guardrail	Steel Plate	Steel Pipe	Square Tubing	Steel Railing	Galvanized
Price Change, December 2023	14.0%	-2.5%	8.0%	16.5%	2.5%	N/A	5.3%
Expected Price Change, January 2024	14.0%	2.5%	8.0%	16.5%	2.5%	N/A	2.5%
Expected Price Change Q3 FY 2024	7.8%	2.5%	8.0%	16.5%	2.5%	N/A	5.3%
Bid Price Change, December 2023	10.3%	2.5%	18.0%	16.5%	2.5%	N/A	5.3%
Production Change, December 2023	-8.0%	N/A	N/A	0.0%	N/A	8.0%	2.8%
Expected Production Change, Jan. 2024	13.0%	N/A	N/A	7.8%	N/A	8.0%	10.5%
Expected Prod. Change Q3 FY 2024	18.0%	N/A	N/A	13.0%	N/A	8.0%	19.3%

Source: TBG Work Product.

Material Quantities

Reinforcing and Structural Steel quantities are estimated using historical ratios. Statewide results are in **Table 13**, while results by District are provided in **Table 14**. **Figure 21** shows total FDOT steel requirements over the Five-year Work Program.

Table 13. FDOT Future Steel Material Requirements

FY	2024	2025	2026	2027	2028
Reinforcing Steel	19,999	18,875	16,774	13,925	11,247
Structural Steel	25,093	23,682	21,046	17,472	14,111
Other Steel	127,597	120,422	107,022	88,845	71,753
Total Tons	**172,689**	**162,978**	**144,842**	**120,242**	**97,111**

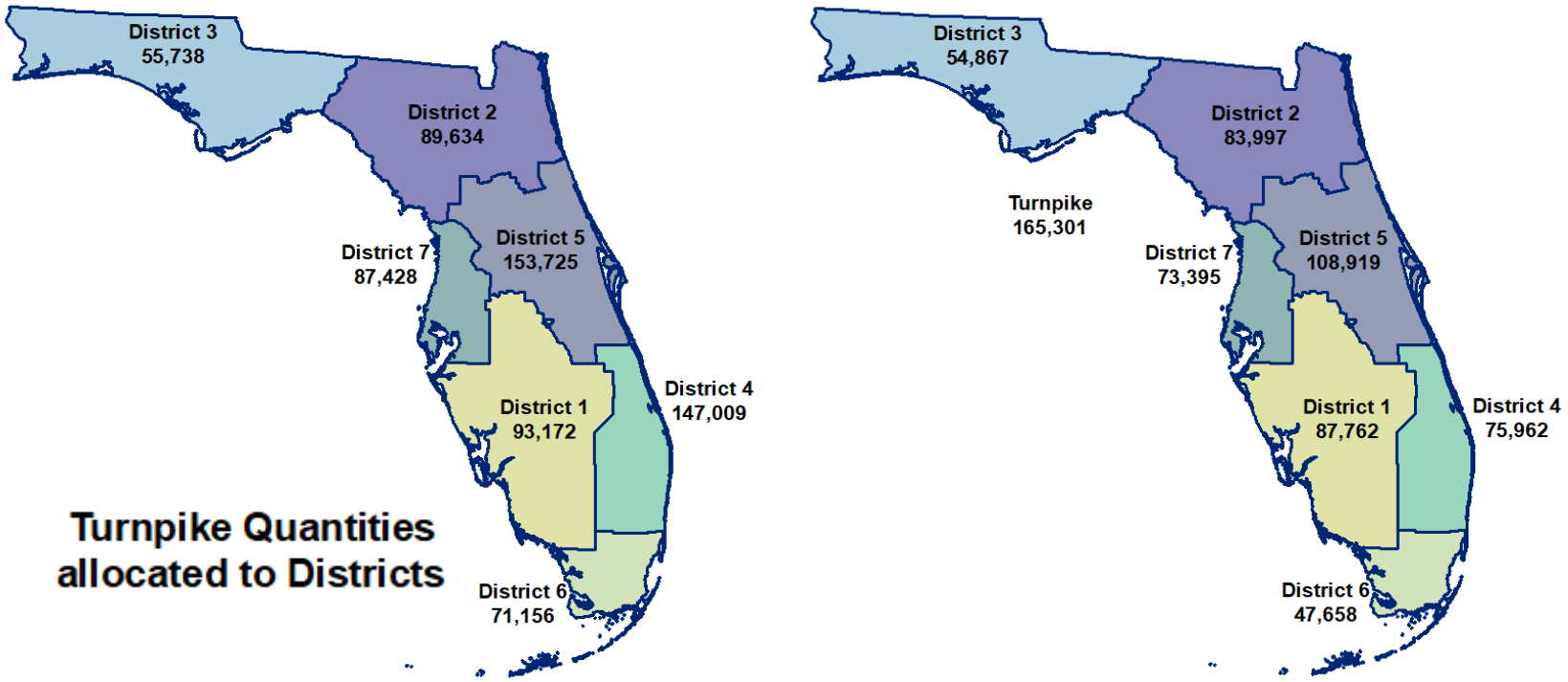
Source: TBG calculated from data provided by FDOT Office of Program Management.

Table 14. FDOT Future Steel Material Requirements by District

District	2024	2025	2026	2027	2028
D1	26,429	8,117	11,009	34,386	7,821
D2	11,149	23,813	15,865	15,817	17,353
D3	22,877	9,661	10,832	6,822	4,675
D4	19,459	18,330	13,897	14,803	9,473
D5	21,949	24,387	39,147	14,913	8,523
D6	19,368	4,542	10,190	9,809	3,750
D7	16,741	19,974	13,148	8,751	14,781
D8	34,717	54,154	30,754	14,941	30,735
Total Tons	**172,689**	**162,978**	**144,842**	**120,242**	**97,111**

Source: TBG calculated from data provided by FDOT Office of the Work Program Budget.

Figure 21. Total Steel Quantities for Five-year Work Program (Tons)



Source: TBG calculated from data provided by FDOT Office of Program Management.

Steel Forecasts

Steel prices were forecasted over the five-year work program. Regression modeling was performed using pay item data, supply chain variables, and other macroeconomic indicators to identify models that best predicted FDOT's materials costs. **Table 15** provides the forecast average price for structural and reinforcing steel.

With updated iron and zinc prices and macroeconomic conditions, the best estimate of structural steel costs is 1% lower than the previous report. Year-to-date prices have risen above the upper bound based on limited bid data. Interviews indicate fluctuating prices, with some quoting additional increases from FY 2023 levels and others seeing discounts from their suppliers last quarter. In the upper bound, coal prices, a driver for steel manufacturing, and higher economic growth support price increases. A flatter commodity price scenario is shown in the lower bound.

Table 15. FDOT Structural Steel Price Forecast Results

Fiscal Year	2023	2024	2025	2026	2027	2028
Price Structural Steel, $/lb.	$3.51	$3.55	$3.75	$3.93	$4.15	$4.37
Annual Percent Change, %	-21.4%	1.1%	5.7%	4.9%	5.4%	5.5%

Source: TBG calculated from data provided by FDOT Estimates Office, various industry sources.

Weighted average reinforcing steel price forecasts are about 8% higher than previous estimates with updated bid data (**Table 16**). Reinforcing Steel price have been relatively flat over the last quarter, continuing to sit close to FY 2023 levels. The best estimate, which currently predicts a slight decline in pricing for FY 2024 year-end according to updated construction employment measures and medium crude oil pricing, is tracking very close to the year-to-date price. The upper bound takes Florida economic growth, construction employment, and medium crude oil prices into consideration, while the less likely lower bound is supported by lower crude prices.

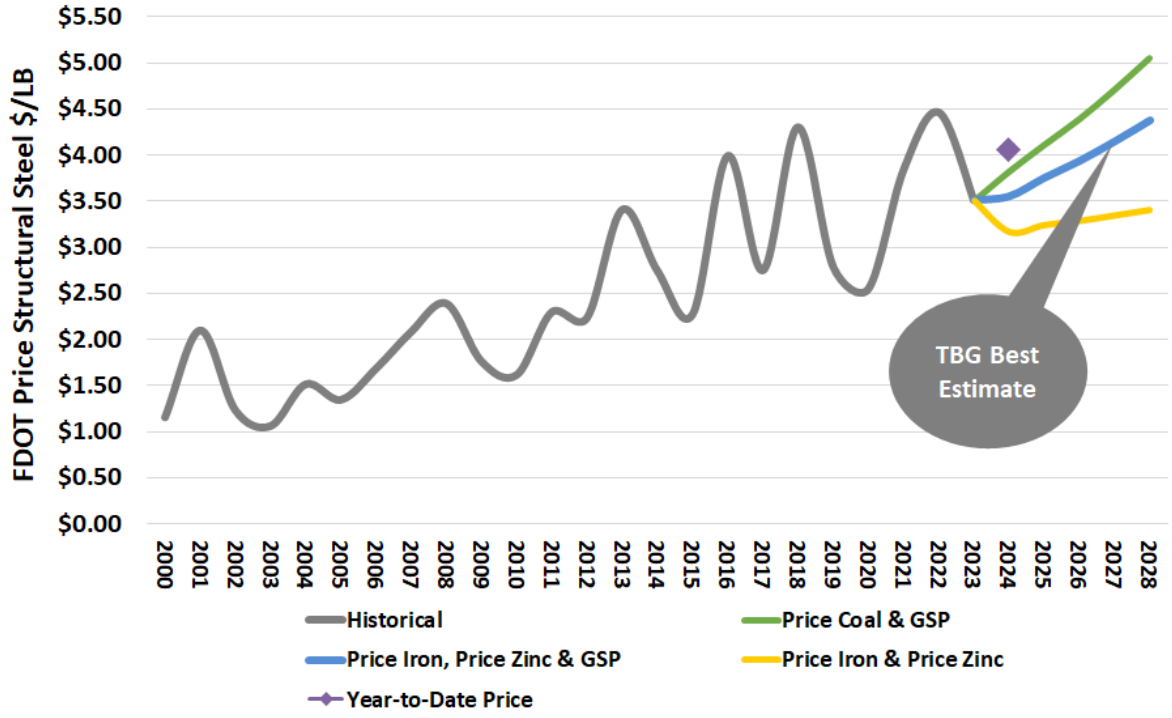
Table 16. FDOT Reinforcing Steel Price Forecast Results

Fiscal Year	2023	2024	2025	2026	2027	2028
Price Reinforcing Steel, $/lb.	$1.52	$1.51	$1.53	$1.56	$1.61	$1.66
Annual Percent Change, %	2.2%	-0.8%	1.4%	1.8%	3.0%	3.4%

Source: TBG calculated from data provided by FDOT Estimates Office, various industry sources.

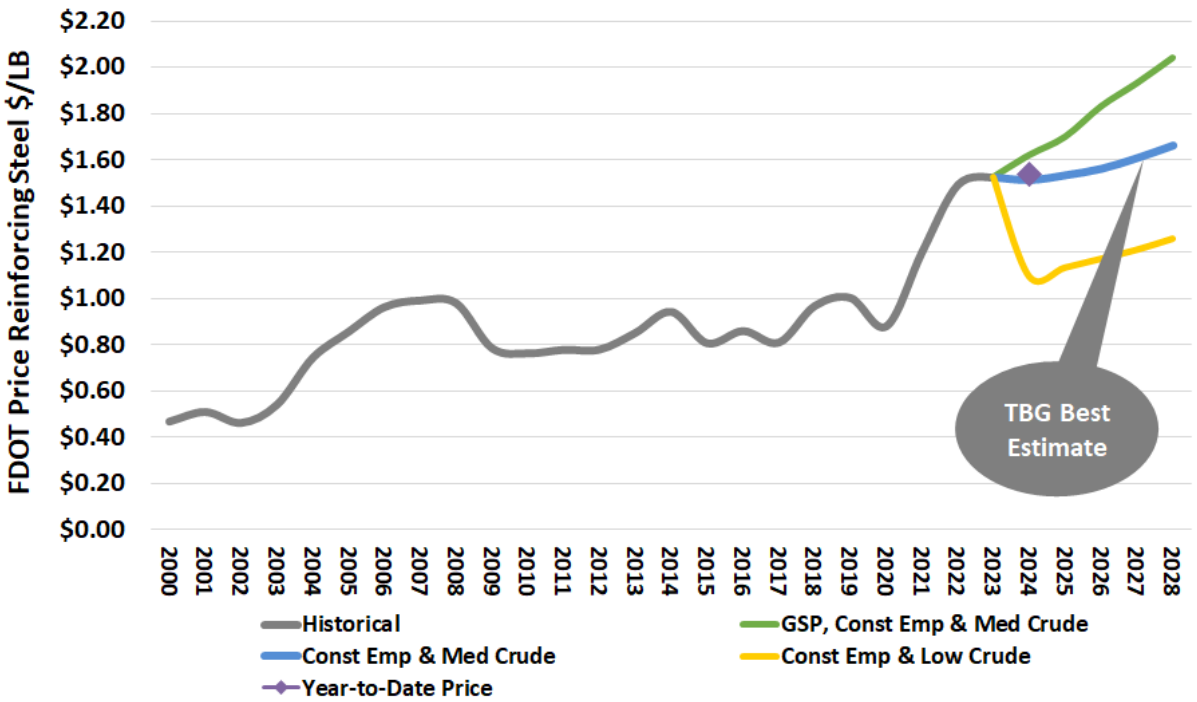
Figure 22 and **Figure 23** show the output of several price models and the scenario identified as best estimate for structural steel and reinforcing steel, respectively.

Figure 22. FDOT Structural Steel Price, FY 2024 Q2 Forecast



Source: TBG calculated from data provided by FDOT Estimates Office, various industry sources.
(Variable descriptions available in the **Appendix**.)

Figure 23. FDOT Reinforcing Steel Price, FY 2024 Q2 Forecast



Source: TBG calculated from data provided by FDOT Estimates Office, various industry sources.
(Variable descriptions available in the **Appendix)**

AGGREGATE

Summary

- While overall U.S. production of crushed stone declined, production in Florida increased slightly in November 2023 according to the latest available data. New leases to import aggregate were approved at the Port of Tampa.
- Reported price increases (15%-20%) were within the what companies expected occurred as expected over the summer. For calendar year 2024, the industry expects similar conditions as 2023.
- Trucking costs negatively affected producers during the quarter. Labor also had negative impacts as producers reported that availability can be unpredictable.

FDOT Impacts

- FDOT's aggregate base bids are up a staggering 76.5% in the second quarter of FY 2024 compared to year-end FY 2023 prices. Aggregate bids should be closely monitored.
- FY 2024 bids are currently forecast to increase by 14.9% compared to FY 2023, much lower than year-to-date price increases, but still a significant increase.
- As BABA import restrictions do not apply to aggregates, identifying additional sources of FDOT approved stone types from outside the state and the U.S. should be a priority.

General Trends

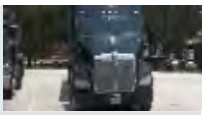
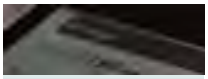
According to quarterly data released by the USGS, crushed stone production in Florida for the third quarter of calendar year 2023 (July 2023 – September 2023) was down 1% year-over-year. Year-to-date production was down 0.4% at 70 million metric tons. This slowdown was less severe than the national trend, where production declined 3% in the quarter and almost 1% through the year. For calendar year 2024, the overall expectations are that conditions will be similar or slightly down compared to 2023 levels with continued infrastructure spending supporting demand. Publicly traded companies continued with similar results as previous quarters as shipments were flat-to-lower and prices still at double-digit increases. As indicated elsewhere in the report, these trends have been seen by producers of other materials as they reported issues with aggregate availability, higher costs and announced price increases starting January 1st.

Exerting negative influence on FDOT's costs; monitor.
Currently stable; not influencing FDOT's costs.
Exerting positive influence on FDOT's costs.

SUPPLY CHAIN VARIABLES: **AGGREGATE**

Table 17 provides current status of selected supply chain variables.

Table 17. Aggregate Supply Chain Variables

 Raw Materials	The USGS reported that Florida's crushed stone production decreased 1% during the third quarter of calendar year 2023 compared to the same period in 2022. Nationally, production declined 3%. Prices from publicly traded companies showed same trends from previous report with year-over-year increases between 15% and 20%; volumes were slightly down by as much as 7%. Interviews indicated a wider range of increases (5% to more than 75%); however, they all attempt to pass off some of the costs. For calendar year 2024, the industry expects volumes to be flat or slightly lower than 2023 with infrastructure projects supporting demand. They expect some moderation in prices. In addition to the approved Ajax Paving and Pangaea Florida leases mentioned in Asphalt's supply chain table, the Port of Tampa also approved a 10-year lease (with options to extend for Redwing Terminals (import division of Blue Water Industries) to import limestone, granite and crushed concrete.	↑
 Access to Land	Access to land with suitable deposits is key to cost-effective material extraction for FDOT Aggregate. As previously reported, the new Waters of the United States (WOTUS) rule went into effect on September 8th, but is being challenged by construction and transportation organizations. Uncertainty in the industry is expected to continue. No changes during this quarter.	=
 Rail	Rail is the primary transportation for aggregates from Georgia, and from Lake Belt to Central and Northeast Florida. In the third quarter of calendar year 2023, tons and revenues of aggregate products shipped by rail increased by 4% and 6% year-over-year, respectively. This indicates some moderation in price increases. However, these statistics are for CSX's whole system as location specific data is not available.	↑
 Trucking	Diesel prices have declined since the significant increase reported in the previous report in October of 2023 and are just above the lows in July of 2023 at $2.63 per gallon. Year-over-year, diesel prices are down 31%. However, interviews indicated that trucking continues being an issue due to fuel costs.	↑
 Labor	Producers continue reporting issues with finding skilled labor. Some indicated that availability is inconsistent as conditions can go from improving to shortages in a short period of time. Others indicated that conditions worsened during the quarter. As mentioned elsewhere in the report, statewide construction employment has slowed down, while hourly growth rates continue being higher.	↑
 Competition	Continuing the trend of previous reports, new mines were approved in FDOT's approved producer list (two in District 5 and one in District 7). As BABA restrictions do not apply to aggregates, expanding access to imports may help alleviate supply constraints in the state. A provider of aggregate materials announced the opening of a new location in Daytona Beach to supply material to the region.	=
 Capital Costs	Industry now expects federal interest rates could start declining as soon as March 2024. However, rate decreases will likely be slow and remain above 5% through the next quarter.	↑

Material Quantities

Materials requirements have been estimated for the five-year work program. Pay item data from 1994 forward was evaluated to calculate the share of project expenditures attributable to aggregate within asphalt and concrete quantities, as well as pure base requirements. **Table 18** provides the results statewide. Future FDOT aggregate requirements by District are shown in **Table 19**.

FDOT demand for aggregate for Base, Asphalt, and Concrete is expected to average 10.7 million tons annually over the five-year work program. Total demand of FDOT's five-year Work Program for aggregate is about 53 million tons. Total FDOT aggregate requirements for the five-year Work Program by District are shown in **Figure 24**.

Table 18. FDOT Future Aggregate Material Requirements (in thousands)

Year	2024	2025	2026	2027	2028
Base Material and Other Aggregate	2,841	3,137	3,286	2,568	2,481
Aggregate for Asphalt	4,452	5,100	4,734	4,082	4,246
Aggregate for Concrete	3,601	2,397	3,813	3,752	2,776
Total Tons	**10,893**	**10,634**	**11,833**	**10,402**	**9,504**

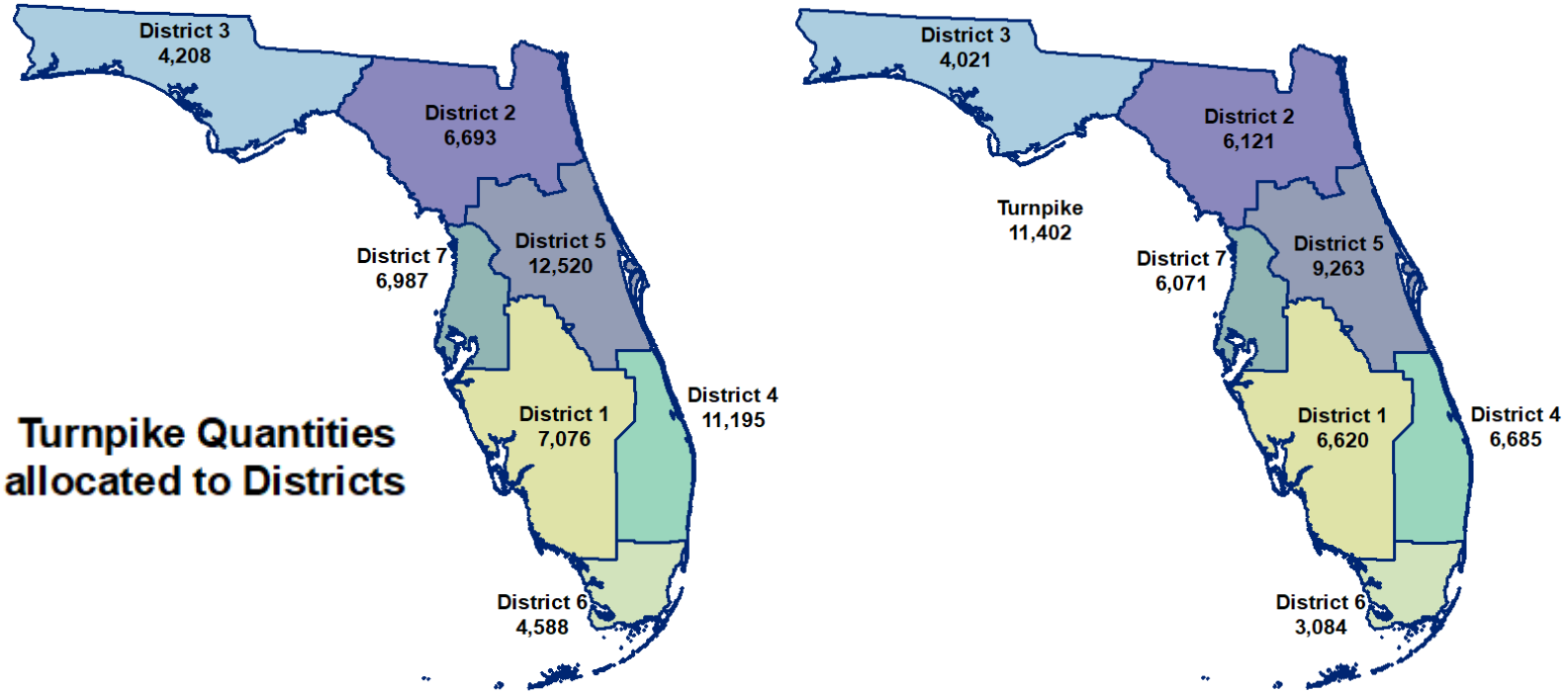
Source: TBG calculated from data provided by FDOT Office of Work Program and Budget.

Table 19. FDOT Future Aggregate Material Requirements by District (in thousands)

District	2024	2025	2026	2027	2028
D1	1,576	673	923	2,813	635
D2	968	1,314	1,053	1,406	1,379
D3	1,245	820	946	634	375
D4	1,214	1,426	1,298	1,367	1,380
D5	1,405	1,761	3,360	1,417	1,320
D6	1,007	342	771	697	267
D7	1,159	1,386	1,257	877	1,392
D8	2,319	2,910	2,226	1,191	2,755
Total Tons	**10,893**	**10,634**	**11,833**	**10,402**	**9,504**

Source: TBG calculated from data provided by FDOT Office of the Work Program Budget.

Figure 24. Total Aggregates Quantities for Five-year Work Program (000s Tons)



Source: TBG calculated from data provided by FDOT Office of Program Management.

Aggregate Base-Course Forecast

Regression modeling was performed to estimate aggregate base costs using pay item data, Work Program funding, and supply chain variables and other macroeconomic indicators. **Table 20** provides the forecast average price for aggregate base.

Table 20. FDOT Aggregate Base Price Forecast Results

Fiscal Year	2023	2024	2025	2026	2027	2028
Price Aggregate Base, $/SY	$26.32	$27.81	$29.11	$30.58	$32.19	$33.87
Annual Percent Change, %	13.9%	5.6%	4.7%	5.0%	5.3%	5.2%

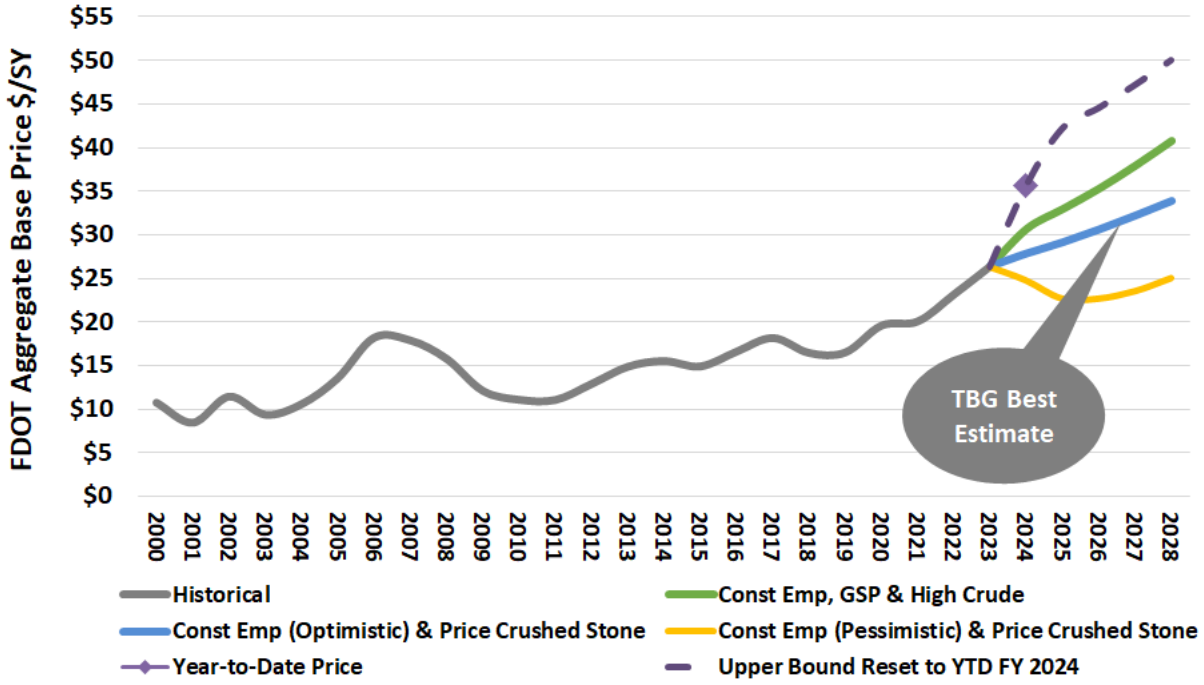
Source: TBG calculated from data provided by FDOT Estimates Office, various industry sources.

Updating the forecast model with current input cost projections results in a 3% adjustment to previous forecasts. Through the second quarter of FY 2024, the weighted average price of aggregate base continues to exceed modeled forecasts at $45 per square yard due to one extremely high-cost, high-quantity bid from September 2023. Excluding this bid, the FY 2024 year-to-date weighted average price falls to $36 per square yard, still about $8 higher than the best estimate forecast for FY 2024. Given second quarter bids, prices may moderate slightly throughout the remaining fiscal year, but FDOT may need to continue adapting to much higher costs.

The best estimate model considers construction employment growth and statewide stone pricing, supporting a steep increase in prices just under $35 per square yard through FY 2028. The upper bound includes construction employment and economic growth and high energy costs, resulting in prices topping $35 per square yard in the latter half of the five-year work program. A second upper bound was provided to show how prices may increase if the year-to-date trajectory holds; this level of pricing is not supported by economic projections, currently, but is shown for context. The lower bound would yield lower aggregate base prices, but they would remain above pre-pandemic levels.

Figure 25 shows the output of several price models and the scenario identified as best estimate for aggregate base.

Figure 25. FDOT Aggregate Base Price, FY 2024 Q2 Forecast



Source: TBG calculated from data provided by FDOT Estimates Office, various industry sources.
(Variable descriptions available in the **Appendix**.)

EARTHWORK

Summary

- Truck driver availability and retention were issues producers faced during the quarter even as truck employment in Florida continues to increase.
- While diesel prices were 31% lower year-over-year, the significant increase seen early in the quarter caused trucking costs to rise for producers.
- Equipment and truck costs continue being lower year-over-year. However, producers indicated that prices are higher compared to other years.

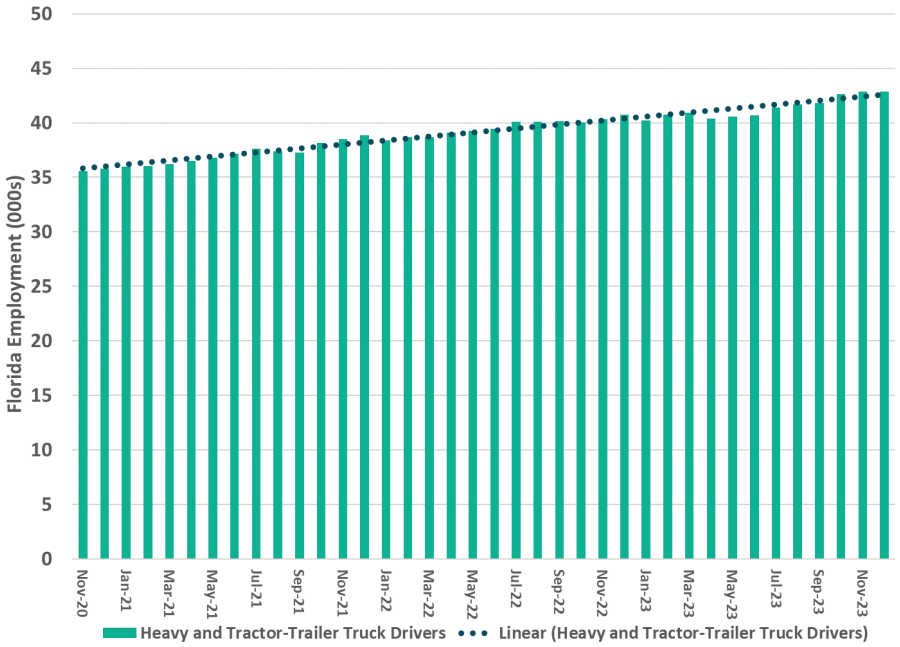
FDOT Impacts

- Earthwork costs through the second quarter of FY 2024 more than doubled FY 2023 levels, rising to over $23 per cubic yard.
- Current pricing is overshooting forecasts at this time. Earthwork bids should be closely monitored next quarter as other state DOTs continue to report wildly fluctuating earthwork costs. Excess contingency may need to be considered in final estimates if market conditions continue to support very high bids.

General Trends

Overall truck transportation employment continues with a steady growth. In December 2023, employment rose 5%, year-over-year (**Figure 26**). As mentioned throughout the report, diesel costs rose early during the current quarter, but have declined since and were down 31% year-over-year. Additionally, some producers indicated issues finding drivers. Consequently, trucking costs rose during the quarter. On the other hand, the FLHSMV requested an exemption on the way CDL tests have to be carried out so that CDL applications can be processed more efficiently.

Figure 26. Florida Truck Transportation and Driver Employment, 2020 – 2023

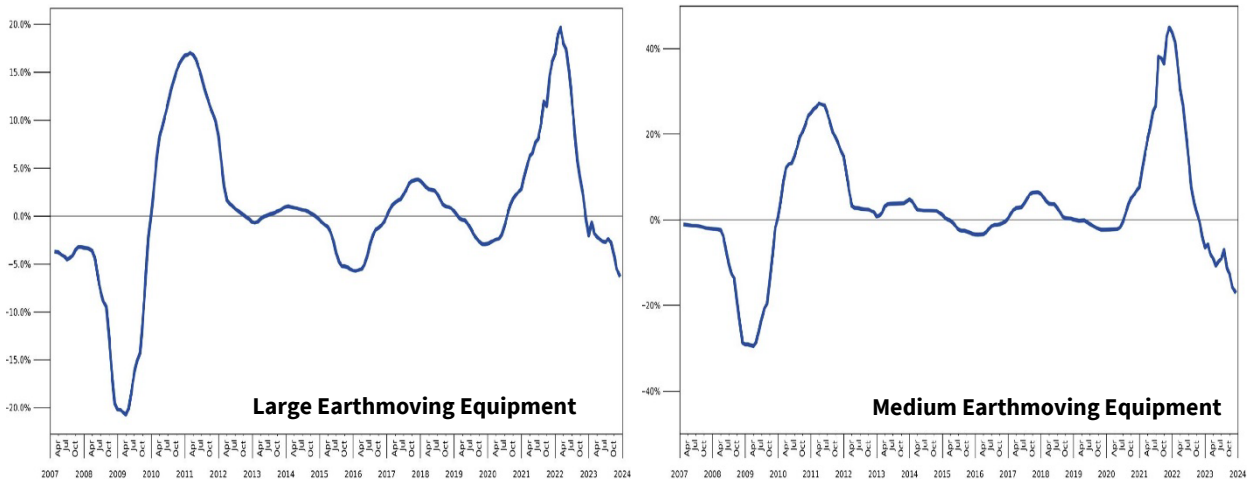


Source: TBG work product, BLS.

Equipment

The January 2024 used equipment market trends report released by Ritchie Bros. shows that prices for used large and medium earthmoving equipment continued declining. Large and medium earthmoving equipment fell 6% and 17% year-over-year, respectively (**Figure 27**). Lee Tractor, a construction equipment dealer, recently announced that they are expanding service into the Panhandle (up to Pensacola). This can help contractors with reduced waiting times for repairs or new equipment.

Figure 27. 3-Month YoY Change in Price Indexes for Large and Medium Earthmoving Equipment

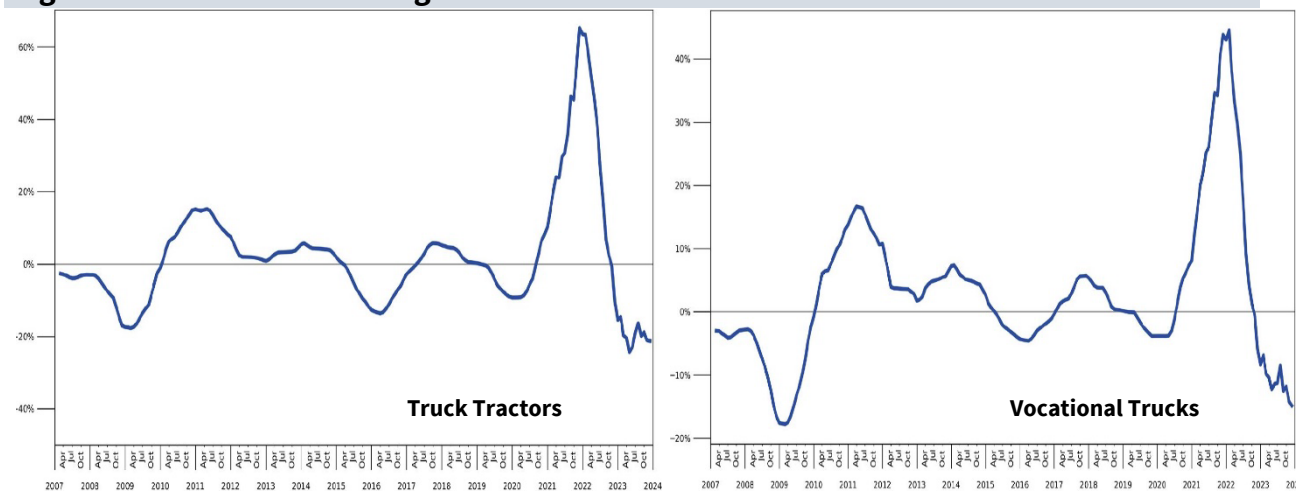


Source: Ritchie & Bros. Used Equipment Market Report.

Trucking

Used truck prices fell again during the quarter. The 3-month average costs of truck tractors and vocational trucks were down 21% and 15% year-over-year, respectively (**Figure 28**). [7]

Figure 28. 3-Month YoY Change in Price Indexes for Truck Tractors and Vocational Trucks



Source: Ritchie & Bros. Used Equipment Market Report.

[7] Including bulk hauling, heavy hauling, and other construction vehicles

Earthwork Forecast

Regression modeling was performed to estimate Earthwork costs using pay item data, supply chain variables and other macroeconomic indicators. **Table 21** provides the forecast average price for earthwork. **Figure 29** shows the output of potential price models and the scenario identified as best estimate for earthwork.

The same situation as described in the aggregate base forecast applies to earthwork, with one extremely high-cost, high-quantity bid from September 2023 heavily influencing the year-to-date weighted average price. Excluding this bid, the FY 2024 the weighted average earthwork price declines from $24 per square yard to $14. While above the FY 2023 year-end prices, the picture is not as dire as including the outlier bid would make it.

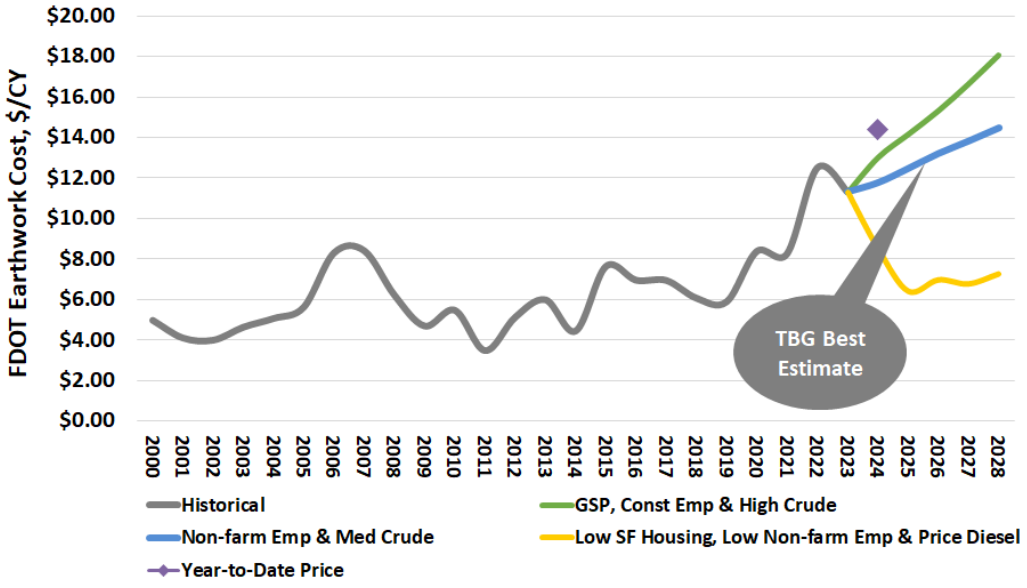
Current earthwork forecasts are 10% higher than previous estimates with updated FDOT bid and industry data. Revised employment and fuel forecasts show the best estimate rising to year-to-date prices within the five-year work program. However, the upper bound forecast is currently being overshot despite updates to infrastructure funding, construction employment growth, and crude prices. In the lower bound, recessionary conditions would be necessary to drive down costs back to pre-pandemic levels.

Table 21. FDOT Earthwork Price Forecast Results

Fiscal Year	2023	2024	2025	2026	2027	2028
Price Earthwork, $/CY	$11.31	$11.77	$12.48	$13.22	$13.85	$14.50
Annual Percent Change, %	-9.5%	4.0%	6.0%	6.0%	4.7%	4.7%

Source: TBG calculated from data provided by FDOT Estimates Office, various industry sources.

Figure 29. FDOT Earthwork Price Estimates, FY 2024 Q2 Forecast



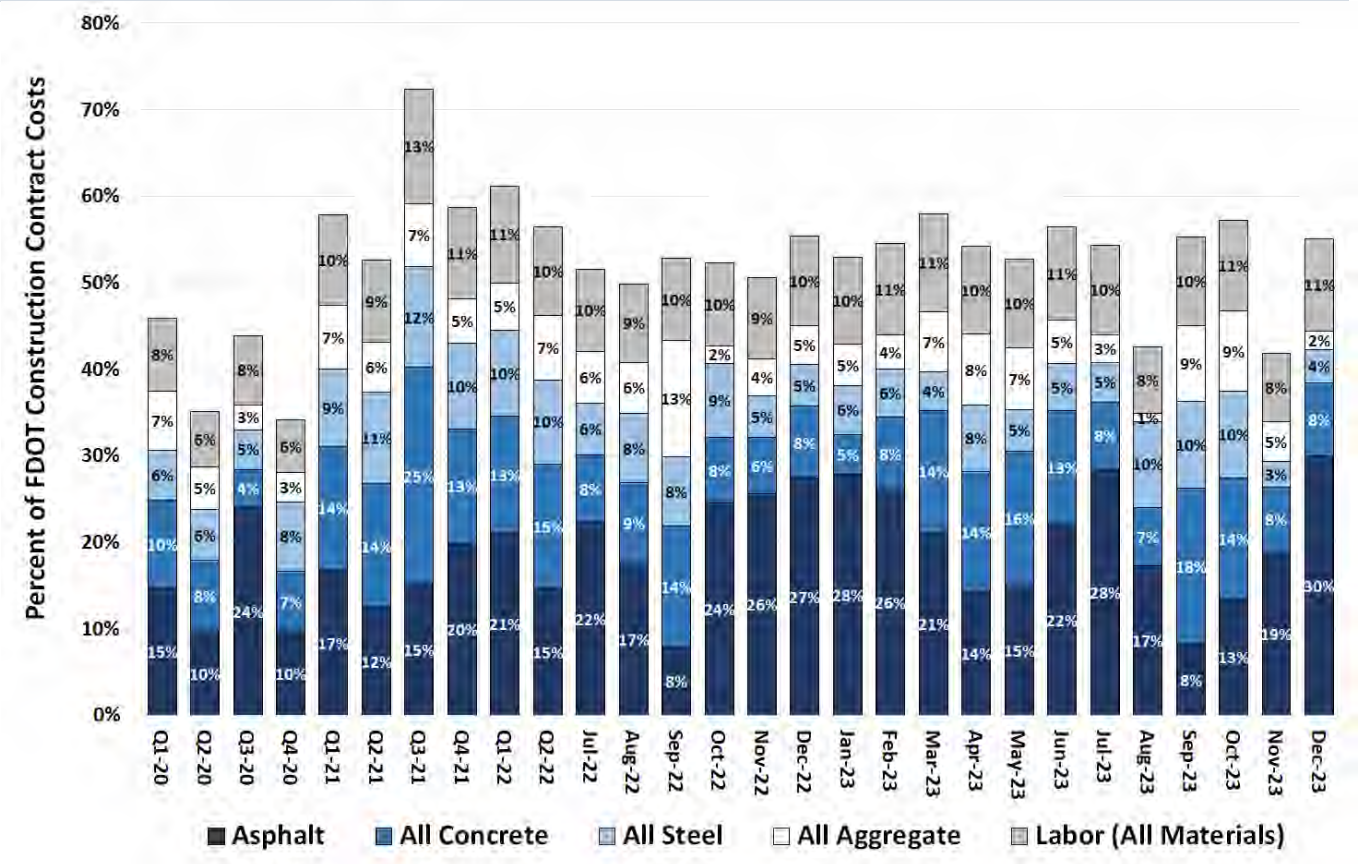
Source: TBG calculated from data provided by FDOT Estimates Office, various industry sources.
(Variable descriptions available in the **Appendix**.)

APPENDIX A: UNDERLYING ECONOMIC CONDITIONS

FDOT Cost Composition

Tracking FDOT's costs by month shows how the cost composition may shift depending on project type, scheduling, and material costs (**Figure A- 1**). Asphalt costs as a share of total costs surged in December 2023 after several months of lower activity according to preliminary data. Concrete and steel costs as a share of total costs fell to historical norms in December 2023 compared to previous periods. Despite recent price hikes, aggregate costs as a share of total costs were low in December according to the latest bid data. Labor costs remain stable, but higher than pre-pandemic levels.

Figure A- 1. Monthly Cost Composition

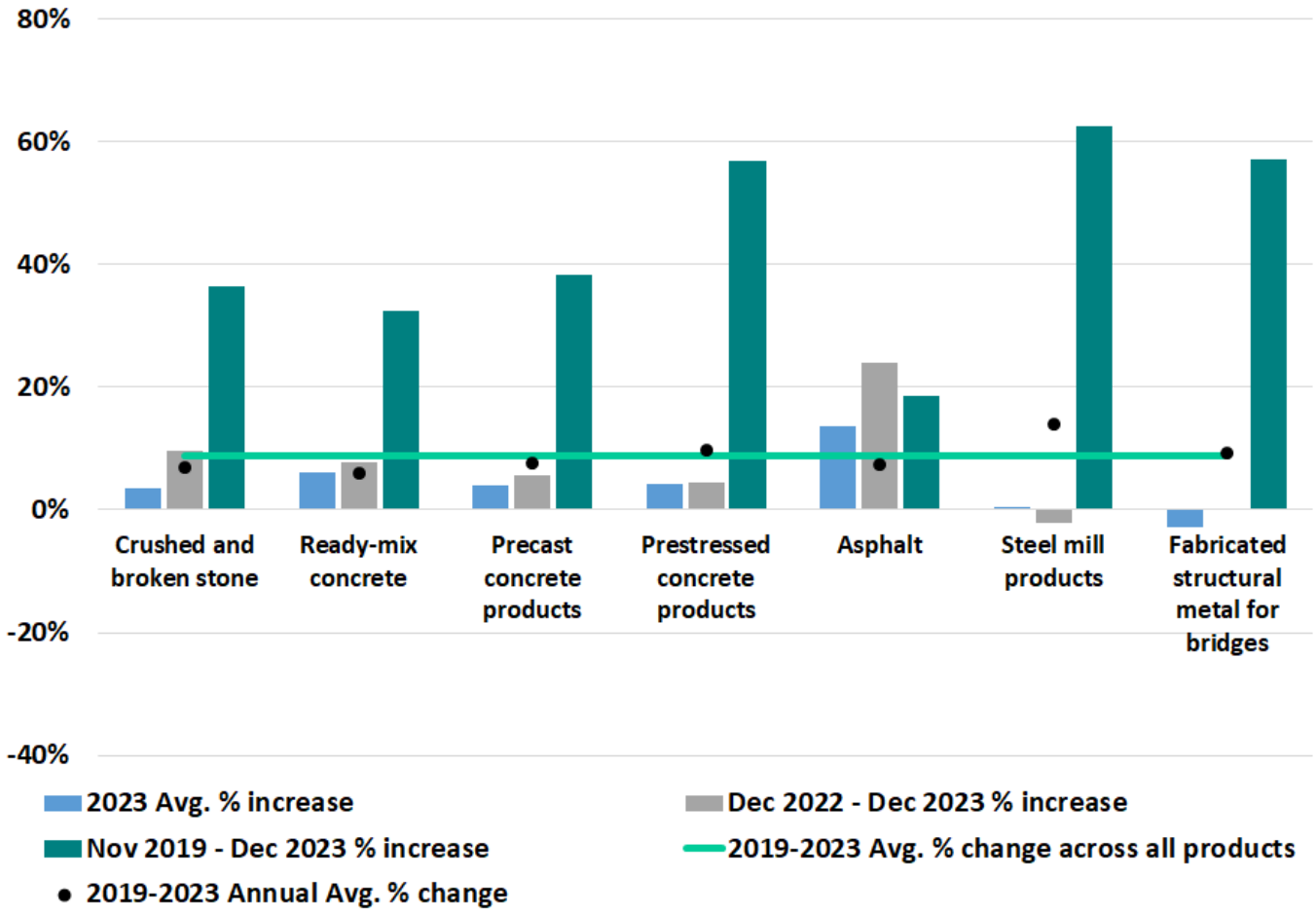


Source: TBG calculated from data provided by FDOT Estimates Office.

U.S. Inflation

Another measure of inflation for the construction industry is the BLS PPI by commodity type. **Figure A- 2** illustrates select PPI measures in the U.S. for relevant commodity types. Nationally, a 2.7% average increase was seen across most commodities in calendar year 2023 (blue commodity bars in the graph), with asphalt seeing the largest change (13.7%). Structural metal for bridges declined 2.7% over the same period. Year-over-year changes are indicated by the grey commodity bars in the graph, with asphalt (refinery production), crushed stone, ready-mix, precast, and structural metal for bridges prices increasing by 23.9%, 9.6%, 7.8%, 5.6%, and 0.3% in the U.S., while steel mill products declined by 2%, respectively. [8]

Figure A- 2. Producer Price Index Percent Change by Commodity



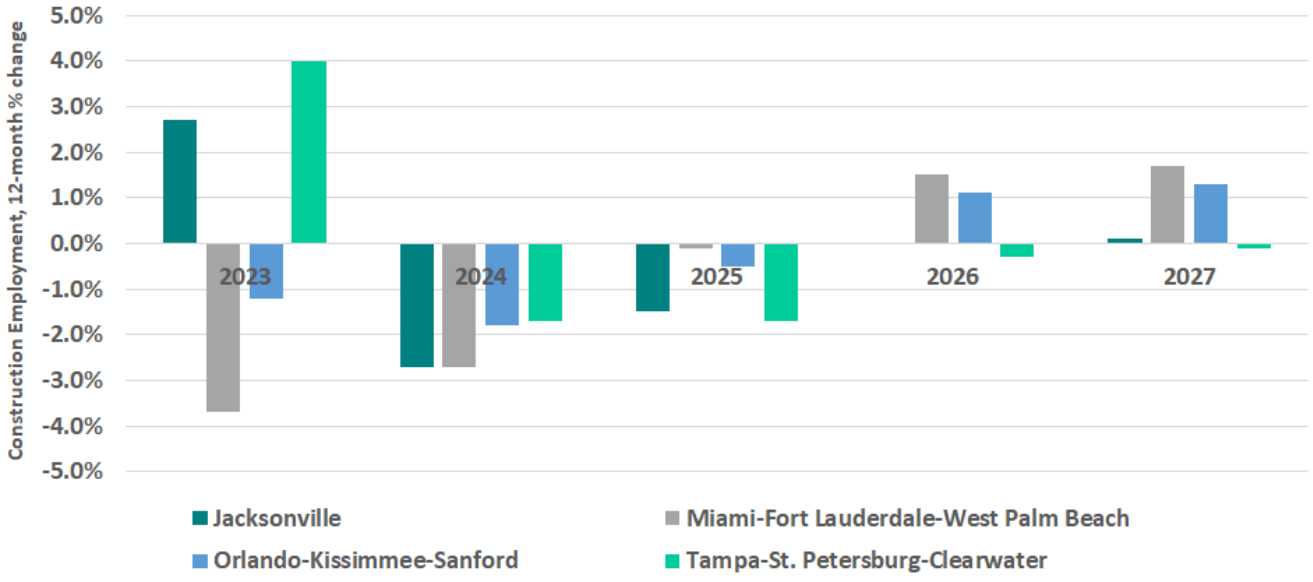
Source: BLS (Producer Price Index, not seasonally adjusted); TBG Work Product.

[8] As a processed good for intermediate demand; i.e. asphalt used at refineries as an input by producers and not the final prices seen by FDOT.

Construction Employment Forecast

According to the Institute for Economic Forecasting's (IEF) most recent Florida & Metro Forecast, statewide construction employment has grown by 0.6% in 2023, even with significant declines in two major markets. IEF expects construction employment growth to decline over the next two years: 2024 by 2.3%, 2025 by 1.2%, and then trend upward slightly in 2026 by 0.4% and 0.5% in 2027. At the metro level, IEF projects construction employment declines in most major markets through 2025 (**Figure A-3**). Construction employment is expected to grow beginning in 2026 for most markets.

Figure A- 3. Historical and Forecasted Changes in Employment in Major Florida Markets, 2023 - 2027

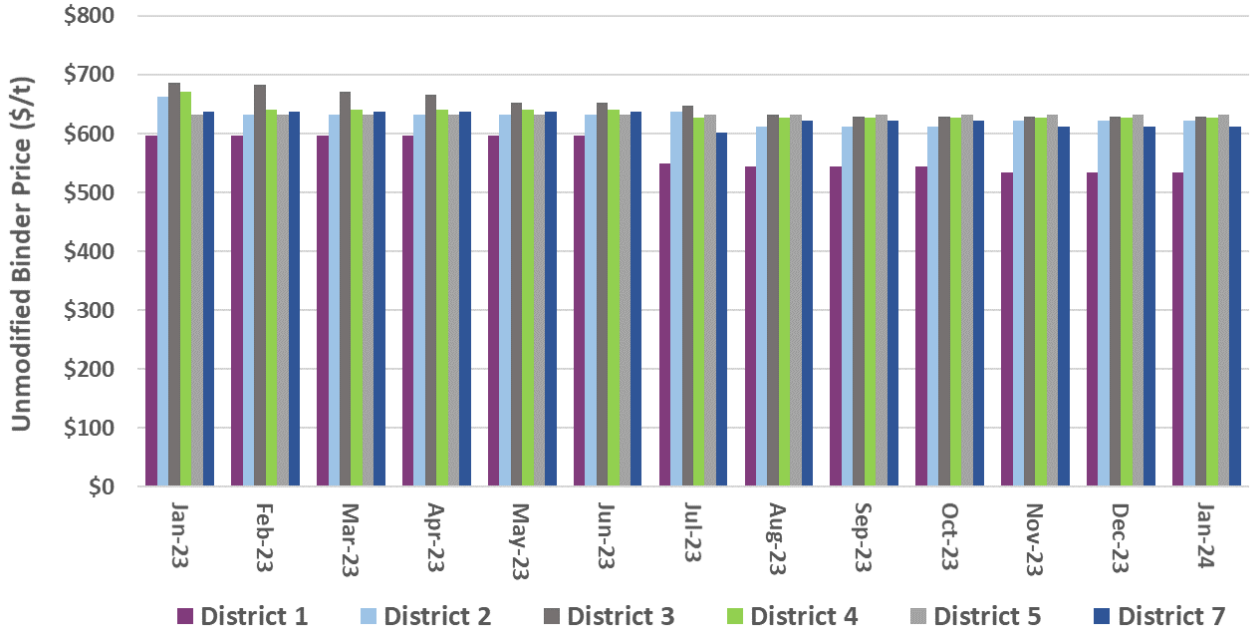


Source: UCF Institute for Economic Forecasting Fall 2023 Florida & Metro Forecast.

Binder Prices by District

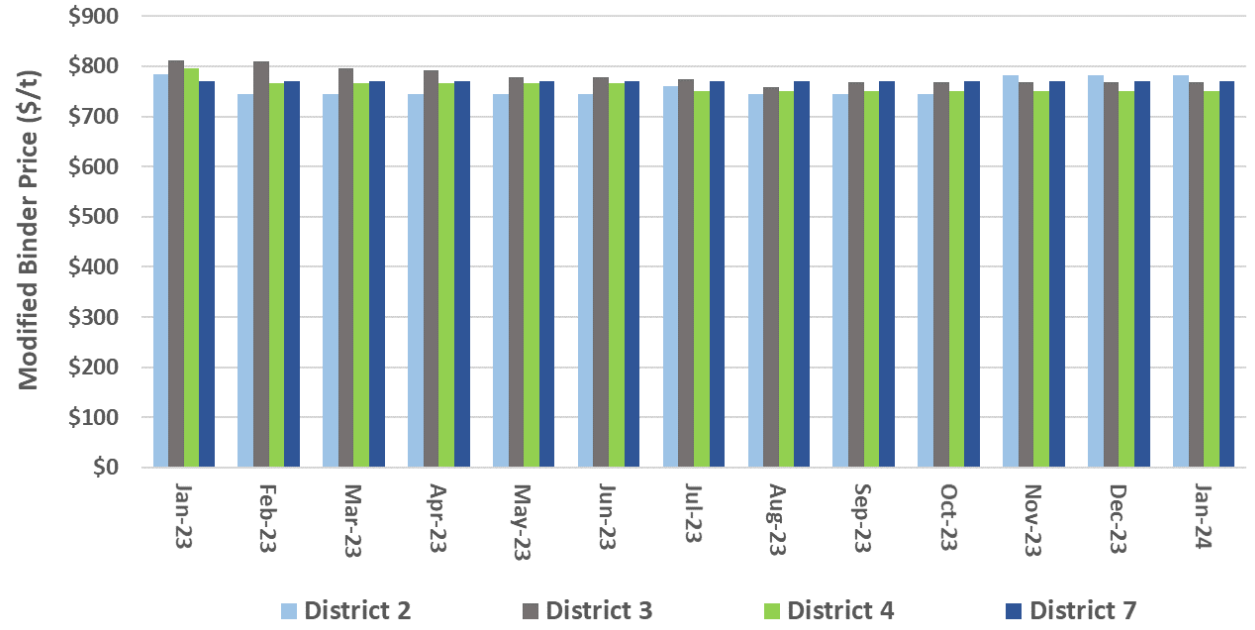
Where available, the average prices for unmodified (**Figure A- 4**) and modified (**Figure A- 5**) binder were calculated from monthly terminal price quotes at the district level. Unmodified binder is the average of PG 52-28 and PG 58-22 prices, while modified binder is a quote for the price of PG 76-22 (PMA) in the dataset. Unmodified binder prices were flat in District 5 and fell in the other districts between 4% and 10% year-over-year. However, prices have been flat or showed little changes since August 2023. Modified binder prices show similar patterns, with prices being flat year-over-year in Districts 2 and 7 and decreasing in Districts 3 and 4 by 5% and 6%, respectively. Of note, since September 2023 modified binder has been imported from Alabama to District 3.

Figure A- 4. Unmodified Binder Price by District



Source: FDOT, TBG Work Product (D6 terminals did not report data).

Figure A- 5. Modified Binder Price by District



Source: FDOT, TBG Work Product (D1, D5, and D6 terminals did not report data).

APPENDIX B: **FORECAST DETAILS**

A description of the variables used in forecasting are provided in **Table B- 1**.

Table B- 1. Forecast Variable Descriptions

Variable Reference	Description
Const Emp	Baseline FL construction employment forecast.
Constrained Emp	Lower (less optimistic) FL construction employment forecast.
Constrained SF Housing	Lower (less optimistic) FL Single-Family housing starts forecast.
FL Cement Price	Average price of cement in Florida.
GSP	FL Gross State Product.
Historical	Historical pricing or quantity.
Housing Starts	FL housing starts.
Indicator WP>$4B	Indicator variable (0,1) for Work Program years with more than $4 billion in planned work.
Low/Med/High Crude	Average crude price (low, medium, or high forecast).
Major Event	Major geo-political, health, or weather-related events that strongly affect market forces; i.e. 9/11, the Great Recession, Hurricane Katrina, the COVID-19 pandemic, and the war in Ukraine.
Non-farm Emp	FL Non-Farm employment.
Price Binder	Average price of HMA binder (PG-76 & higher).
Price Coal	Average price of coal.
Price Diesel	Average diesel price.
Price Iron Ore	Average price of iron ore.
Price Stone	Average price of crushed stone.
Price Zinc	Average price of crushed stone.
SF Housing	FL Single-Family housing starts.
US Cement Price	Average price of cement in the U.S.
WP	FDOT Five-Year Work Program.
YTD	Year-to-Date.

Pay items that are partially or wholly used in the analysis are listed in **Appendix B** of the FDOT SRES FY 2022-23 Final Report[9], starting on page 91. It should be noted that the lists may include some pay items that are no longer in use by FDOT, or are not represented in the lettings data every year, but are retained for historical record.

[9] Main page: https://www.fdot.gov/programmanagement/estimates/documents/sresreports

REFERENCES

American Institute of Architects. (2024). Architecture Billings Index (ABI). Retrieved from: https://www.aia.org/resource-center/aiadeltek-architecture-billings-index

American Iron & Steel Institute. (2024). U.S. Steel Production, Capacity, Utilization, and Consumption. Retrieved from: https://www.steel.org/industry-data/

Association of American Railroads. (2024). Rail Traffic Data. Retrieved from: https://www.aar.org/data-center/rail-traffic-data/

Argus Media Group. (2024). Americas Asphalt Weekly Reports.

ENR. (2024). ENR Construction Index. Retrieved from: https://www.enr.com/economics/historical_indices

ENR. (2024). ENR Material Price Index. Retrieved from: https://www.enr.com/economics/historical_indices

Florida Department of Transportation. Five-Year Work Program, FY2024-2028. Office of Work Program and Budget.

Florida Department of Transportation. Fuel and Bituminous Average Price Index. Retrieved from: https://www.fdot.gov/construction/fuel-bit/fuel-bit.shtm

Florida Department of Transportation. Historical Project Extract. Estimating Systems Support.

Florida Department of Transportation. Long Range Estimates Future Project Extract. Estimating Systems Support.

Florida Department of Transportation. Approved Producers List. Materials Acceptance and Certification System.

MEPS International Ltd. (2024). World Steel Prices. Retrieved from: https://www.meps.co.uk/gb/en/products/world-steel-prices

NABE. (2024). January 2024 Business Conditions Survey Retrieved. from: https://www.nabe.com/surveys

Office of Economic and Demographic Research. (2024). Florida Economic Estimating Conference: Long Run Tables. Retrieved from: http://edr.state.fl.us/Content/conferences/fleconomic/index.cfm

Ritchie & Bros. (2024). Market Trends Report Used Equipment & Trucks.

SteelBenchMarker. (2024). “Price History: Tables and Charts” [Data set].

Surface Board Transportation (2024). “Carloads & Volume Quarterly data”. Retrieved from: https://www.stb.gov/reports-data/economic-data/

Surface Board Transportation. (2024). “Rail service data”. Retrieved from: https://www.stb.gov/reports-data/rail-service-data/

Turner Construction. (2024). Turner Building Cost Index. Retrieved from: https://www.turnerconstruction.com/cost-index

University of Central Florida Institute for Economic Forecasting. (2023). Fall 2023 Florida & Metro Forecast, 2023-2027. Retrieved from: https://business.ucf.edu/centers-institutes/institute-economic-forecasting/

University of Central Florida Institute for Economic Forecasting. (2023). Fall 2023 U.S. Forecast, 2023-2027. Retrieved from: https://business.ucf.edu/centers-institutes/institute-economic-forecasting/

U.S. Bureau of Labor Statistics. Consumer Price Index. Retrieved from: https://www.bls.gov/cpi/

U.S. Bureau of Economic Analysis. Gross Domestic Product: All Industry Total in Florida [FLNGSP], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/FLNGSP

U.S. Bureau of Labor Statistics. Construction, Heavy and Civil Engineering Construction, Truck Transportation and Total Non-Farm State and Area Employment, Hours, and Earnings for Florida [Data files]. Retrieved from: https://data.bls.gov/cgi-bin/dsrv?sm

U.S. Bureau of Labor Statistics. Mining Employment, Hours, and Earnings National [Data set]. Current Employment Statistics Survey. Retrieved from: https://data.bls.gov/cgi-bin/dsrv?ce

U.S. Bureau of Labor Statistics. Producer Price Indexes Commodity Data. Retrieved from: https://data.bls.gov/PDQWeb/wp
U.S. Census Bureau, New Private Housing Units Authorized by Building Permits for Florida [FLBPPRIV], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/FLBPPRIV
U.S. Census Bureau, New Private Housing Units Authorized by Building Permits: 1-Unit Structures for Florida [FLBP1FH], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/FLBP1FH
U.S. Energy Information Administration. Cushing, OK WTI Spot Price FOB Weekly [Data set]. Retrieved from https://www.eia.gov/dnav/pet/hist/RWTCD.htm
U.S. Energy Information Administration. (2024). Short-term Energy Outlook. Retrieved from: https://www.eia.gov/outlooks/steo/
U.S. International Trade Commission. Materials Imports for Consumption [Data set]. Retrieved from: https://dataweb.usitc.gov/
United States Geological Survey. (2023). Cement Statistics and Information. Mineral Industry Surveys. Retrieved from: https://www.usgs.gov/centers/nmic/cement-statistics-and-information
United States Geological Survey. (2023). Crushed Stone Statistics and Information. Mineral Industry Surveys. Retrieved from: https://www.usgs.gov/centers/nmic/crushed-stone-statistics-and-information
United States Geological Survey. (2023). Iron Ore Statistics and Information. Mineral Industry Surveys. Retrieved from: https://www.usgs.gov/centers/nmic/iron-ore-statistics-and-information
World Bank. (2024). Commodity Market prices and forecasts [Data set]. Retrieved from https://www.worldbank.org/en/research/commodity-markets
World Steel Association. (2024). Monthly Steel Production. World Steel Association Yearbook. Retrieved from: https://worldsteel.org/steel-topics/statistics/steel-data-viewer/
World Trade Organization Data Portal. (2024). International Trade Statistics. World Trade Organization. Retrieved from: https://data.wto.org/