







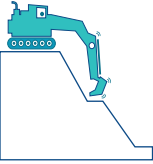
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PREPARED FOR



FISCAL YEAR 23/24
1ST QUARTERLY REPORT
STRATEGIC RESOURCE EVALUATION STUDY
HIGHWAY CONSTRUCTION MATERIALS
CONTRACT BEC18

OVERVIEW: FLORIDA'S HIGHWAY CONSTRUCTION MATERIALS

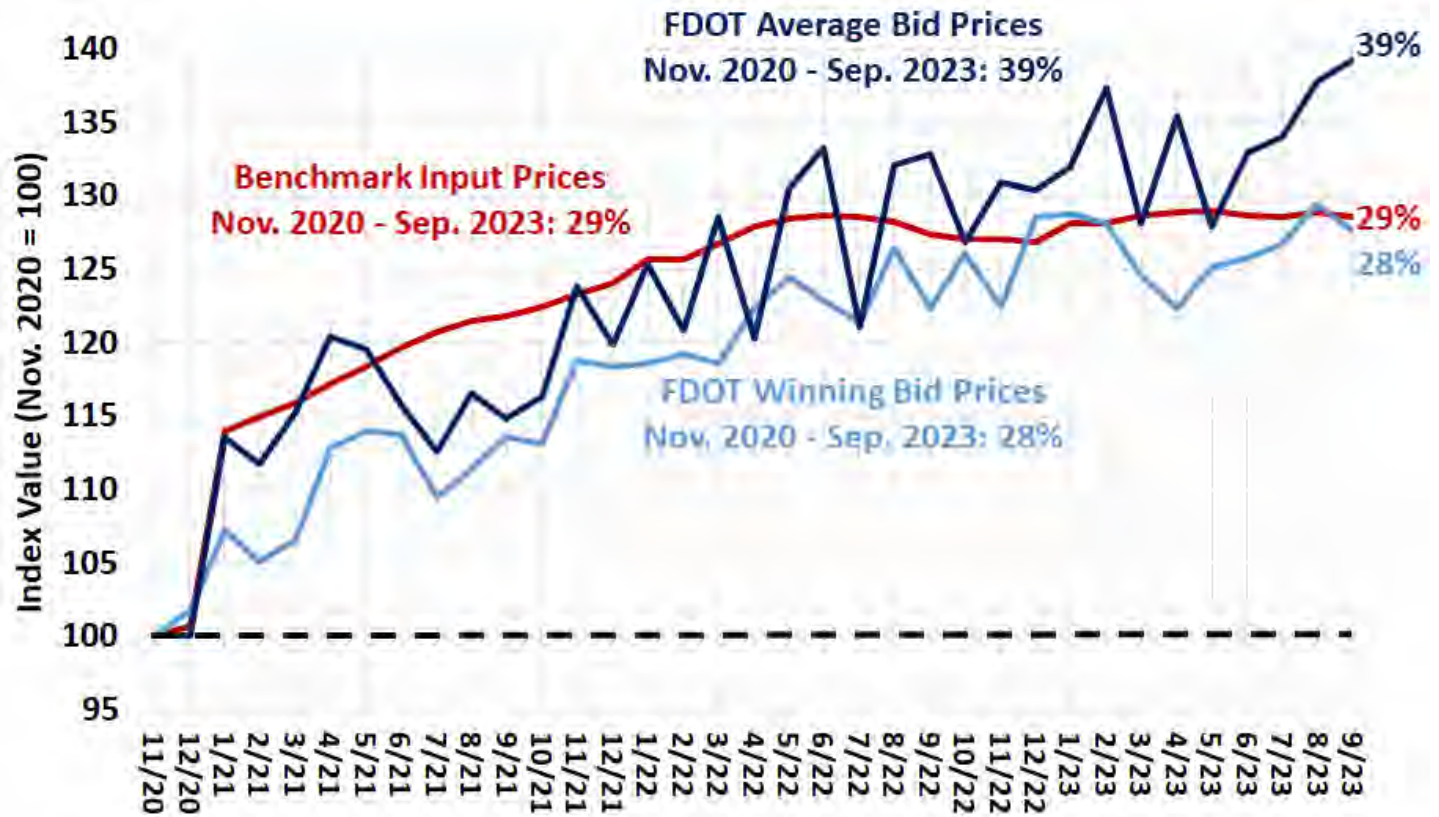
Construction Material	Status
 ASPHALT	<p>Record high asphalt bids continued in the first quarter of Fiscal Year 2023-24 (FY 2024), but within 1% of forecast. Back in June, geopolitical issues affecting binder prices had appeared somewhat more stable, but recent events, high aggregate prices, and heavy competition for resources is supporting higher bid prices. Comparing quarterly results to full year averages has risks, and best estimates show some expected moderation before fiscal year end, but still ending about 5% higher than record FY 2023 prices (with weighted average prices about \$178/ton). If global stability worsens, upper bound/worst case forecasts drift upwards slightly in weighted average price, but FY 2025 increases another 5% - up a total of 50% from FY 2021 prices.</p>
 CONCRETE	<p>Structural concrete prices also reflect continued increases, tracking to the upper bound forecast at more than 22% above fiscal year end prices, although this is based on few bids (n = 15) and 2024 fiscal year-to-date (July – September) estimates. Cement volumes have continued to decline with the housing slowdown (8% year over year), but suppliers expect continued pricing power with the volume of infrastructure work planned. Good news is new fly ash sources on the horizon, and both cement and fly ash are excluded from BABA. Increased imports of aggregate should ease some constraints.</p>
 STEEL	<p>Except for specialty products, lead times and prices for steel and metal products are improving. Stockpiling during previous quarters has slowed with the adjustment in supply chain management. The reduction in hoarding freed up some supply, resulting in fabricators anticipating declines in bid prices. Globally, steel and zinc prices are declining, although this has not translated entirely to the U.S. Labor costs and reduced mill competition, coupled with new geopolitical conflicts, are still clouds on the horizon. Reinforcing steel has flattened, with structural bids slightly higher than forecast.</p>
 AGGREGATE	<p>FDOT aggregate bids are shockingly high, and run counter to lower input costs and historical bidding patterns. As further described herein, the first quarter may not represent the full year, but offers a glimpse of a higher cost future based on strong demand from public infrastructure, resiliency projects, and non-residential sectors. Florida aggregate production declined slightly, but imports from new sources offset some of the declines. In theory, the increased competition should moderate some of the very high supplier prices, but regional producers continue to report planned price increases. BABA resolution should encourage additional imports, relieving some competition for resources, but publicly traded suppliers report confidence in pricing power.</p>
 EARTHWORK	<p>Earthwork bids were astonishingly high in the first quarter, despite lower input costs. Bidding patterns are unusual - small unit jobs drove the very high bids, with 40 projects under 1,000 CY at a weighted average price of \$61.22/CY while a 1.2 million CY project showed a \$47/CY bid. Projects with very high or low earthwork quantities are likely to see premiums embedded in earthwork prices, and warrant close monitoring. Labor constraints and competition for resources from a still-active Florida development market have continued to support very aggressive bidding, despite lower demand in residential sectors which typically has almost immediate effects on earthwork bids.</p>

FDOT Cost Index

The **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 converged in August 2023 with revised bid and industry data. Winning bid prices fell slightly in September 2023, but are still hovering close to benchmark prices according to preliminary bid data. Winning bids were 28% higher than November 2020 prices in September, while benchmark input prices were up 29%. Average bid prices surged through September 2023 at 39% higher than pre-pandemic levels. FDOT’s bid prices have been affected by record high asphalt, aggregate, and labor costs. However, the range between the average bid price index (calculated from all bids) and the winning bid price index remains wide, indicating bidding for FDOT contracts remains 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, TBG Work Product.

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.

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Suggested citation:

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

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INTRODUCTION

The Florida Department of Transportation 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:

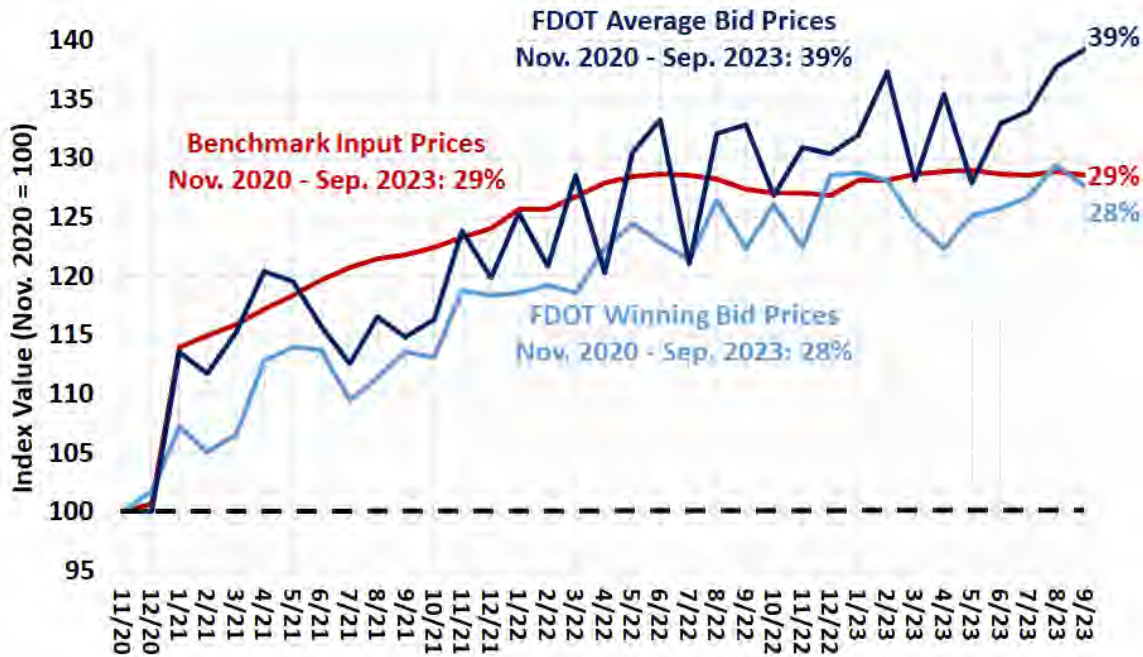
- **General Economic Landscape** for highway construction materials,
- **Work Program Work Mix** allocation and materials quantities estimates,
- **Material-specific findings** for supply chain variables, including
 - raw material sources,
 - existing and likely future transport and distribution methods,
 - 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.

GENERAL OUTLOOK: HIGHWAY CONSTRUCTION MATERIALS

Input Costs vs. Bid Prices

In Florida, regional input prices through September 2023 were up 29% compared to November 2020 levels (**Figure 2**). For awarded (winning) FDOT bids, overall materials prices were 28% higher than pre-pandemic levels over the same period, reflecting a gap of about 1%. For all FDOT bids (meaning the average of all bids received, not just winning bids), price increases continue to climb, topping out at 39% in September - exceeding benchmark input costs for five months in a row. 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



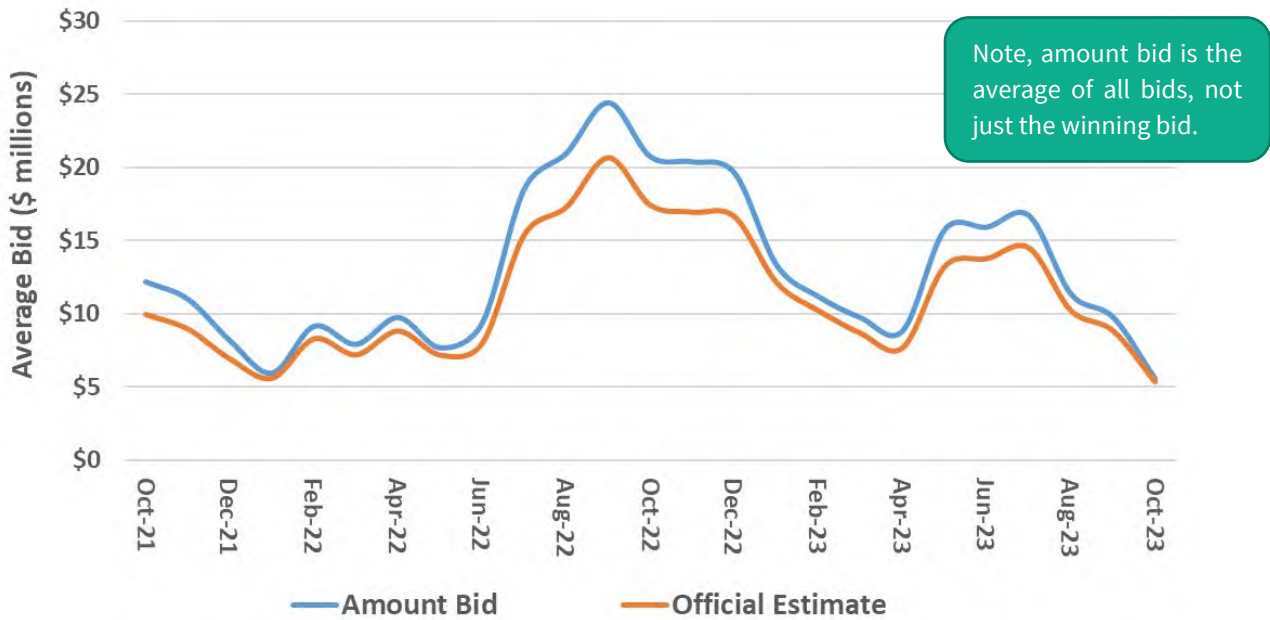
Source: TBG work product, calculated from data provided by FDOT Office of the Work Program and Budget and industry data.

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 first quarter of Fiscal Year 2023-24 (FY 2024), the average deviation of all bids from the mean of all official preliminary estimates was 13%; lower than the previous quarter (**Figure 3**). Excluding contracts exceeding an official estimate of \$100 million from the analysis finds similar results, with bids being 12% higher than the official estimate. The difference between the amount bid by contractors and FDOT official estimates

has narrowed, with official estimates being closer to or on par with contractor expectations over the quarter. This indicates that input cost increases seen over the summer may have moderated.

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



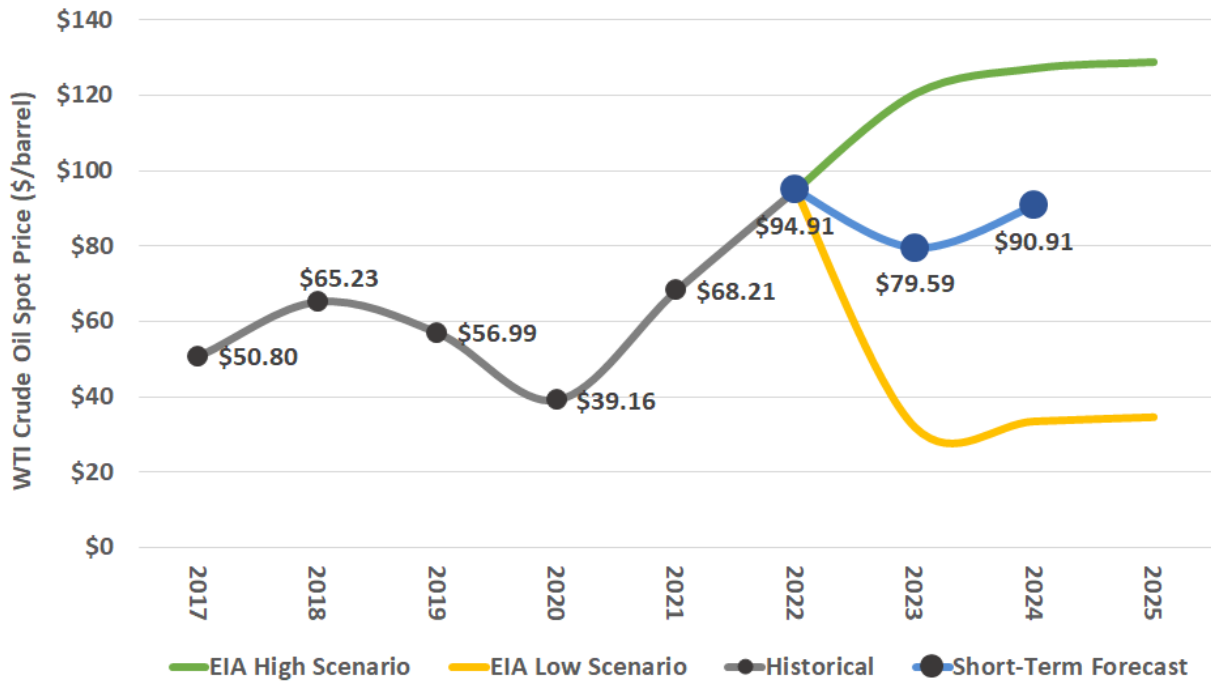
Source: FDOT; TBG Work Product.

Energy Prices

The U.S. Energy Information Administration (EIA) October 2023 Short-term Outlook continues to forecast lower crude oil prices for calendar year 2023 compared to 2022, but the 2024 forecast increased by 16% from \$78.51 per barrel (as reported in July) to \$90.91 per barrel (**Figure 4**). As of this writing, prices declined 4% in October 2023 compared to the previous month. Year-over-year, crude oil prices are down 2%.

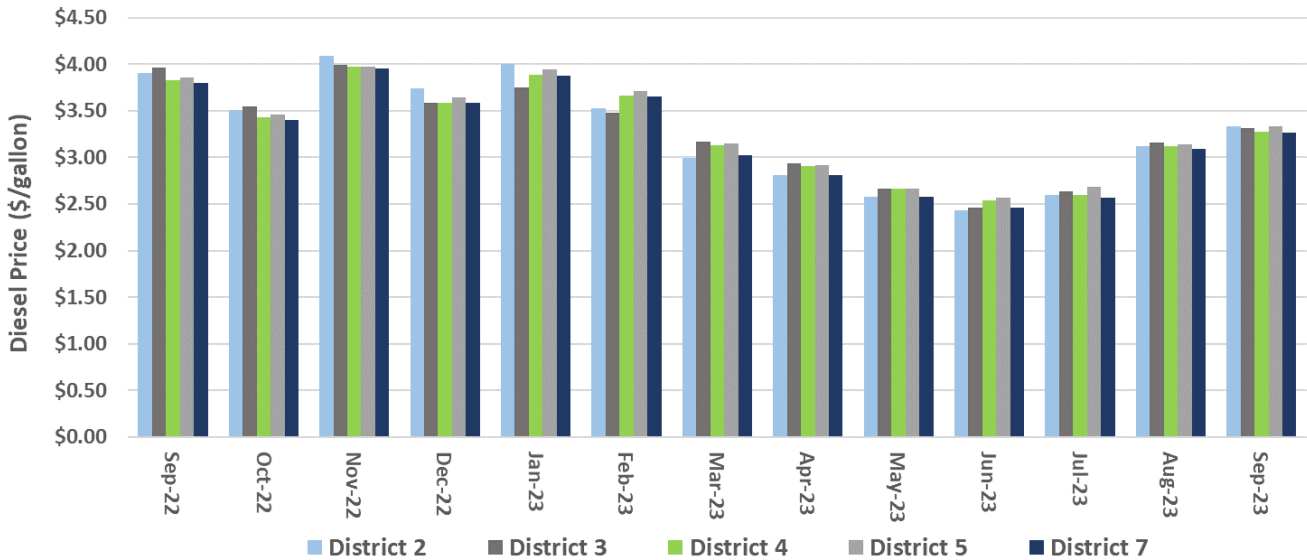
Diesel price quotes from suppliers at terminals around the state averaged \$3.30 per gallon in September 2023, which is a 15% decline year-over-year (**Figure 5**). In September 2023, prices in all districts converged and were between \$3.27 and \$3.33 per gallon. Statewide, the Fuel and Bituminous Average Price Index for diesel increased 7% in October compared to the previous month and prices were up 1% year-over-year. Belvedere Terminals announced that they began planning the construction of three fuel terminals in Jacksonville, Ormond Beach, and Ft. Pierce, plus seven more around the state in the next five years. The additional supply could potentially increase competition and lower prices in the long run. Fuel and oil products are expected to be transported from Mississippi via rail as well. On the international front, Russia put a temporary ban on diesel and gasoline exports to address domestic shortages. This affected global prices and supply in the short-term as countries like Brazil and Turkey rely on Russian imports, so they had to source from other countries such as the U.S. in the meantime.

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

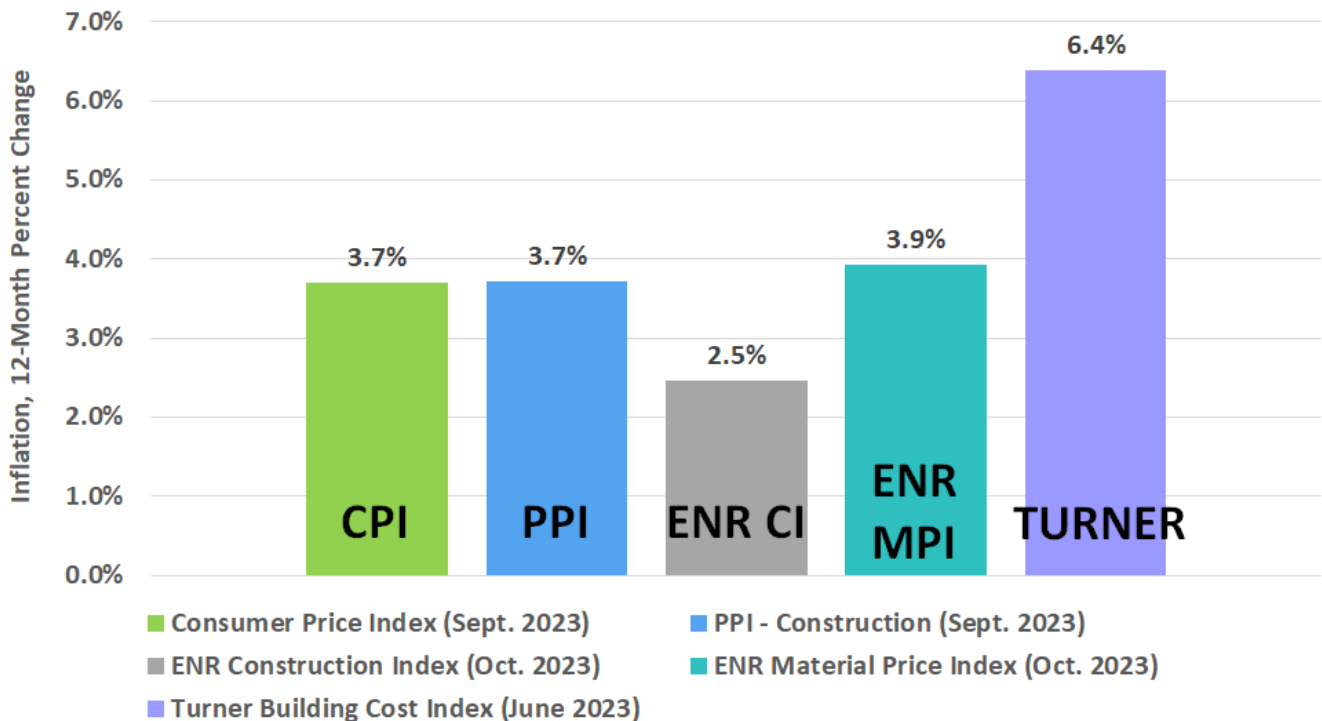


Source: FDOT, TBG Work Product (D1 and D6 terminals did not report data).

Inflation

The Federal Open Market Committee (FOMC) released revised economic projections in September 2023, increasing calendar year 2023 GDP estimates from 1.0% growth (reported in July) to 2.1%. Inflation estimates, on the other hand, are now estimated to be slightly higher by the end of 2023 at 3.7% as of September forecasts, up from 3.2% last quarter. Inflation estimates for 2024 and 2025 were 2.6% and 2.3%, respectively. Other inflation indices ranged between 2.5% to 6.4% last quarter (**Figure 6**). It is important to note that the ENR indices shown below 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:



BUILD AMERICA, BUY AMERICA REQUIREMENTS

The Office of Management and Budget (OMB) has issued Final Guidance for the implementation of Build America, Buy America rules. The guidance, which applies to projects that receive federal grants, excludes aggregates, cement and asphalt from the requirements. Iron and steel products and construction materials, such as plastic and polymer-based products, are still subject to the requirement. The rule went into effect on October 23, 2023.

WATERS OF THE UNITED STATES

In August, the EPA and the Army Corps published the amended rule after the Supreme Court ruled against the agency in the Sackett v. EPA case earlier in the year. The new rule revised significant language, such as removing interstate wetlands as interstate waters. The rule went into effect on September 8th; however, construction and transportation organizations are arguing that the new rule doesn't fully comply with the Judge's ruling, so they are evaluating their options. Uncertainty can be expected to continue.

MINING SCHOOL ACT OF 2023

The legislation would provide grants to improve mining education opportunities. The bill recently passed unanimously out of the Senate Energy and Natural Resources Committee.

DAVIS-BACON ACT CHANGES

The Department of Labor finalized changes that went into effect October 23th, 2023. Among other things, changes include how prevailing wages are calculated for projects with

federal money. Wages must now equal at least 30% (it was 50% before) of surveyed workers in a given area. Workers outside the project location may now also be included under certain circumstances. Industry organizations indicated that this may result in higher costs for contractors and the Associated General Contractors of America (AGC) sued over the changes.

TRUCKING

There has been no progress on the two bills reported in the FY 2022-23 final report (H.R.3013, the LICENSE Act and H.R.3408 DRIVE Safe Integrity Act).

SHIPPING

The Port of Panama City was awarded \$11.25 million from the Port Infrastructure Development Program. Funds will be used for a new warehouse, rail spur extensions and roadway improvements. Additionally, the Florida Ports Council recently submitted comments opposing the proposed critical habitat designation for Rice's whales along the Gulf Coast, which would affect shipping lanes.

OTHER NEWS

The U.S. DOT announced the FY 2024 apportionments for Federal-aid programs under the bipartisan infrastructure law. In total, Florida will receive \$2.6 billion. The majority of these funds will be for the National Highway Performance Program (\$1.5 billion) and the Surface Transportation Block Grant Program (\$718 million).

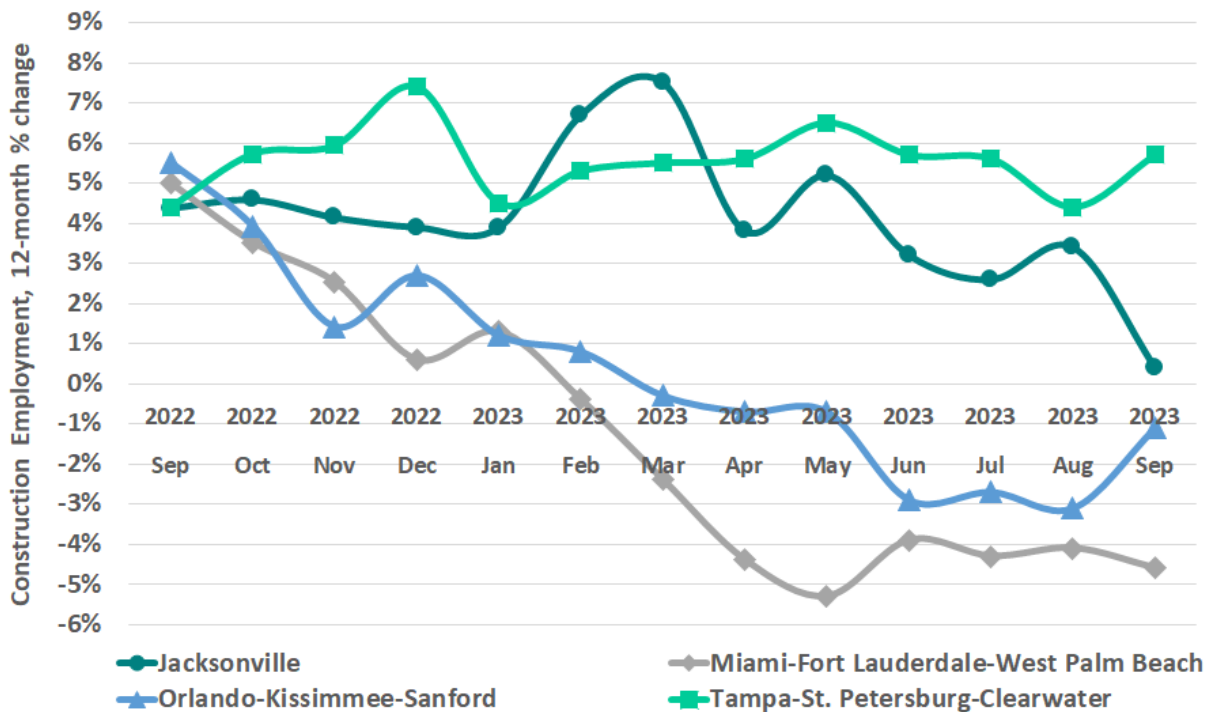
The Auto United Auto Workers strike, which ended on October 30, 2023 and lasted around a month, is expected to temporarily impact overall steel supply and prices as mills adjusted their production in response. Further details can be found in the steel supply chain table.

In October 2023, the House Highways and Transit Subcommittee held a [hearing](#) about solvency issues of the highway trust fund. It also included findings from road use charge pilot programs in Oregon and Washington State for possible new revenue sources for the fund.

Construction Employment

Statewide construction employment growth slowed to 0.9% in September 2023 compared to the same month last year (**Figure 7**). Metro area construction employment activity continued to diverge, with the Tampa area seeing an increase of 5.7% in September 2023, year-over-year, from a position of high growth in August. The Miami and Orlando metro areas continue to experience construction employment losses. In the Jacksonville metro area, where construction employment growth was above 3% for much of the last year, growth has now slowed to less than 1%.

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



Source: Bureau of Labor Statistics.

A recent survey conducted by AGC showed that construction firms in Florida continue to struggle to find workers. 80% indicated having open positions and 85% indicated that they are struggling filling those positions. The main reason for this was that candidates were not qualified to work in the industry. Additionally, 64% indicated project delays due to worker shortages.

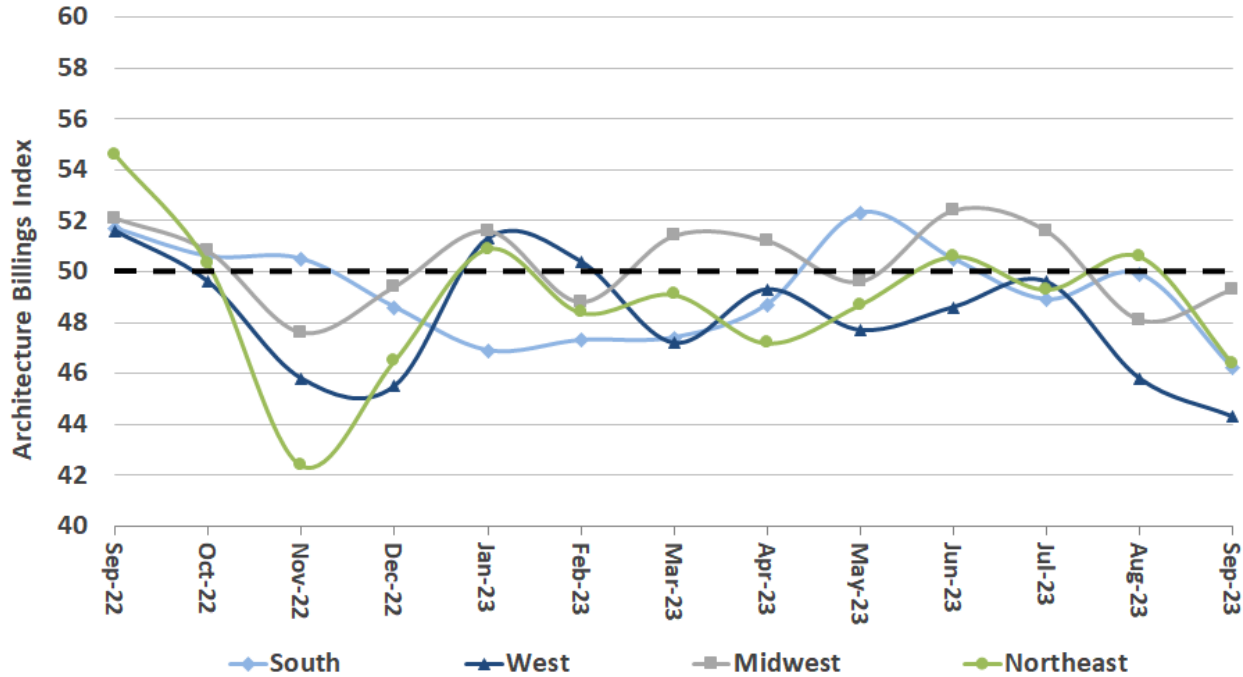
Billings

The Architecture Billings Index (ABI) is a leading indicator for nonresidential construction activity.¹ Nationally, the index was 44.8 in September, indicating that a majority of architecture firms saw decreased billings at their firms (**Figure 8**). The last time the index was this low was in January 2021. All four regions were below 50 for the first time since December 2022, with scores worsening across

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.

the board compared to the previous report. As skilled labor shortages, high material costs, and international conflicts affecting global market stability continue, billings could soften further through the end of the calendar year.

Figure 8. ABI Billings Index, Sep. 2022 – Sep. 2023



Source: American Institute of Architects, Architecture Billings Index

Rail

On September 7th, the Surface Transportation Board (STB) issued a notice of proposed rulemaking in reciprocal switching for inadequate service issues. The rule would allow shippers to request a transfer of carriers when they fail to meet the minimum in any of three performance standards (service reliability, service consistency and inadequate local service). The rule would require Class I carriers to report relevant data and the STB is proposing the reciprocal switching agreements would last at least two years and up to four years. As expected, shippers have reacted positively towards this proposal.

CSX’s employee counts have continued increasing. In September 2023, the company had 7,763 train and engine employees, a 6% increase year-over-year. In regards to operating performance, average terminal dwell time (October 2023 vs. July 2023) in Jacksonville increased 6 % to 21 hours and 13% in Waycross, GA to 24 hours.² The overall system dwell time in October 2023 was 20 hours, so while Jacksonville is still comparable, delays in Waycross are higher. Higher dwell times means that it takes more time to get material out of the station, which could lead to project delays.

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

ASPHALT

Summary

- Binder prices declined 7% in the first quarter of FY 2024 compared to FY 2023, but remain 25% higher than fiscal year-end 2020 prices.
- Asphalt and aggregate products were excluded from BABA’s requirements, which was a concern for asphalt producers and FDOT contractors.
- Asphalt producers report persistent issues with labor and aggregate availability.

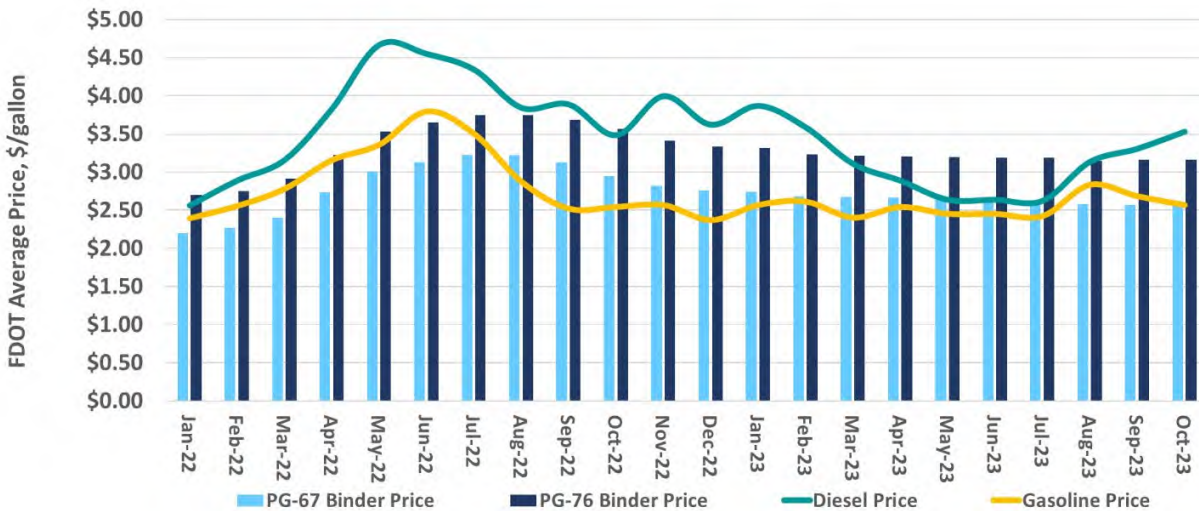
FDOT Impacts

- FDOT and competing infrastructure demand is expected to keep asphalt bids high.
- During the first three months of FY 2024, FDOT HMA weighted average bid prices were 7% higher than fiscal year-end 2023 prices.
- Asphalt cost projections are tracking at a similar pace with the best estimate for FY 2024, measuring 5.4% higher than FY 2023 prices.

General Trends

FDOT fuel prices had a significant increase in August 2023; both gasoline and diesel were 1% higher year-over-year in October 2023 (**Figure 9**). On the other hand, binder prices have been much less volatile and continued marginal declines across the year. Demand for asphalt paving will continue to be supported by infrastructure funding. Argus tracks U.S. asphalt inventories and while they were above the 5-year range for several months in 2023, they declined rapidly in September and October as refiners try to reduce inventories. U.S. net production of asphalt has declined in calendar year 2023, but supplied product (a proxy for consumption) on the East coast is unchanged, supporting higher prices.

Figure 9. FDOT Fuel and Asphalt Binder Prices, Jan. 2022 – Oct. 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 1 provides the current status of selected variables of interest.

Table 1. Supply Chain Summary: Asphalt Materials		
	The U.S. Geological Survey (USGS) reported that Florida's crushed stone production decreased 1% during the second quarter of calendar year 2023 and was flat year-to-date. Aggregate prices continued increasing. Interviews continue indicating that availability of raw materials is a common issue.	
	Refinery utilization in the Gulf Coast has been between 87% and 95% in 2023 since July through October. Costs and prices will continue to be affected by geopolitical factors, such as production quotas announced by the Organization of the Petroleum Exporting Countries (OPEC+). For instance, Saudi Arabia and Russia announced that they would extend their voluntary cuts through the end of 2023.	
	Unmodified (PG 67 & lower) asphalt binder prices continue declining. In calendar year 2023, they have declined 6% and since September 2022 they declined 18%. Rack binder prices in Jacksonville, Miami and Tampa declined 11%, 13% and 12% year-over-year, respectively. Global oil supply-demand dynamics are changing with Russian oil sanctions. The EIA estimated that net production of asphalt in the Gulf Coast decreased 12% in 2023 through July. However, asphalt supplied in the East Coast was flat in 2023 year-over-year through July. This indicates demand for resources in the East coast is still high. Binder was excluded from BABA requirements in the final guidance published by the OMB.	
	U.S. production of resins increased 6.9% in August 2023 vs. August 2022. Year-to-date production increased 0.9% year-over-year, according to the American Chemistry Council (ACC). The US Chemical Production Regional Index (CPRI) rose by 0.7% in August compared to July. Year-over-Year, the U.S. CPRI decreased 2%. June 2023 earnings of a publicly traded company show reference prices and production costs for many polymers continued seeing double digit declines (as much as to 43% year-over-year), but volumes were mixed. These factors benefit asphalt producers as they lower costs, but could affect supply in the long-term. However, a new 625,000 metric ton per year polyethylene unit was started up in Bayport, Texas in October 2023. Producers have not indicated issues finding polymers.	
	Data from the U.S. International Trade Commission (ITC) shows that imports of bitumen products to ports that service the Florida market declined 26% in fiscal year 2023. Countries of origin include Canada, Colombia and Spain. If producers are able to find product locally, then they are less exposed to issues with freight. For instance, some producers had delays in ports due to hurricane and tropical storm conditions during the quarter. In September 2023, Crowley and SEACOR Holdings announced an agreement that will combine their petroleum and chemical vessels to create a Jones Act vessel service provider. It is expected to take place in 2024 and will be based in Fort Lauderdale. This could help to prevent price increases with more ships available. Additionally, in October 2023, the U.S. eased sanctions on Venezuela's oil production and imports for six months.	
	In Q1 of calendar year 2023, tons and revenues of asphalt products shipped by CSX, regardless of the destination, increased by 22% and 27% year-over-year, respectively. These indicate that price increases haven't eased. As mentioned elsewhere in the report, the STB published a reciprocal switching proposal to address service issues.	
	Asphalt suppliers continue facing issues with trucking. Fuel costs are one major factor. While diesel prices had significant year-over-year declines earlier in 2023, they saw a 35% increase since July 2023. As a result, in October 2023 they were 1% higher year-over-year. Reports indicate that, after UPS and the union reached a new labor agreement, interest for UPS' driver jobs rose significantly. Indeed indicated that job searches rose by 50% and US Packaging & Wrapping did analysis of google searches by state and Florida was in the top 10. All these represent more competition and increased costs for producers.	
	As mentioned in the polymers section, the CPRI rose month-over-month in August 2023 and production of coatings, adhesives and other specialty chemicals increased too. Overall, pavement markings and other plastics-based/polymer-based ancillary products would be subject to BABA requirements and volatility in crude oil markets in terms of production and pricing.	
	Finding skilled labor is an ongoing concern for asphalt plant operators. As mentioned elsewhere in the report, statewide construction employment has slowed down. However, hourly construction wages in Florida were 7% higher year-over-year in September. A new AGC survey showed that construction contractors in Florida continue struggling finding skilled labor, which has caused project delays. Interviews indicate that skilled labor availability is worsening.	
	The number of producers in FDOT's approved list and in FDEP's air permitted list was unchanged.	

Asphalt Forecast

Asphalt prices are projected in **Table 2** for the five-year construction work program (July 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.

Global conflicts continue to impact crude oil futures, shifting expectations for FY 2024 upward from the previous forecast. With updated housing starts, employment data, and binder prices, asphalt price forecasts show best fit with continued high prices through the end of the five-year work program. July 2023 FDOT work program funding levels, statewide economic growth, and elevated binder costs are expected to keep bids high in the short-term.

The lower bound line reflects falling crude prices and further constraints on construction employment. This scenario would require a substantial economic downturn, but only 40% of economists currently predict this outcome in 2024.³ The upper bound is supported by a medium crude projection, continued Florida macroeconomic growth, and significant supply chain disruption, such as major weather events, war, or other geopolitical conflicts. **Figure 10** shows the potential range of estimates over the five-year work program.

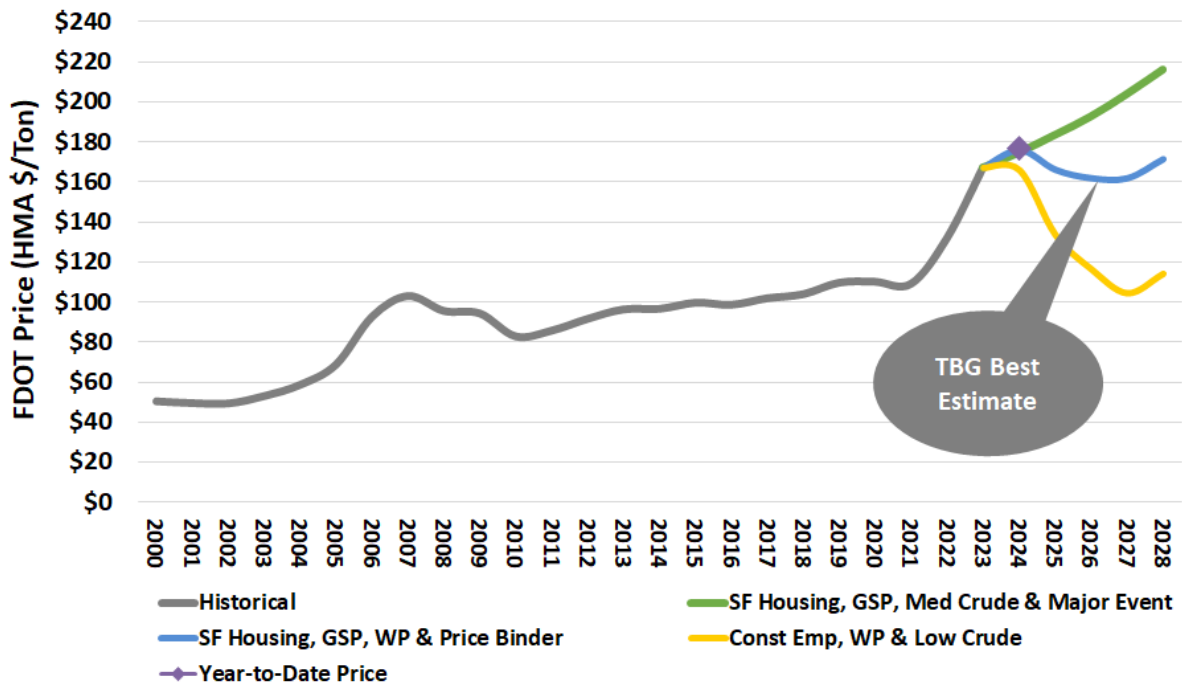
Fiscal Year	2023	2024	2025	2026	2027	2028
Price HMA, \$/Tons	\$167.07	\$176.07	\$166.10	\$161.85	\$161.82	\$171.44
Annual Percent Change, %	26.6%	5.4%	-5.7%	-2.6%	0.0%	5.9%

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

Figure 11 provides a forecast of Florida HMA consumption. The best estimate assumes stable employment, moderating housing starts, and medium crude oil price projections. The lower bound would take effect if recessionary factors come into play. Given record infrastructure funding at every level of government, this scenario is considered unlikely at this time. The upper bound takes increased labor availability and lower fuel costs into account and would allow for additional production.

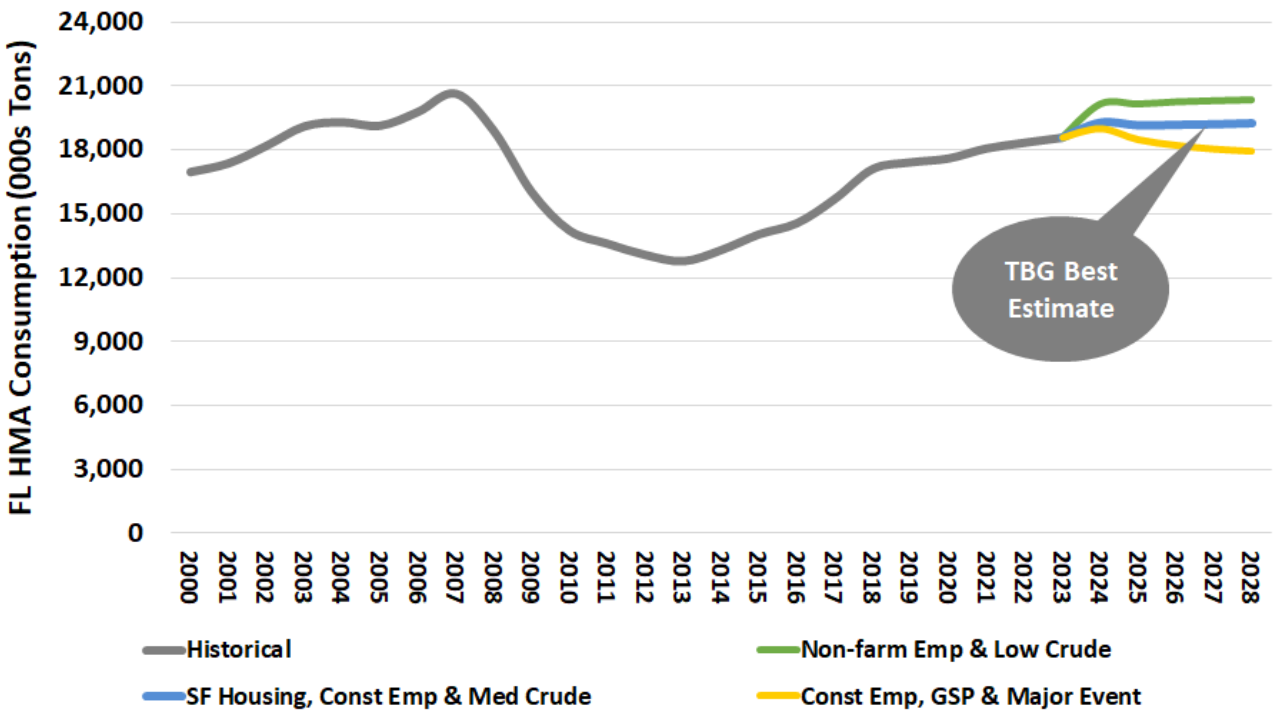
³ NABE October 2023 Quarterly Business Conditions Survey.

Figure 10. FDOT HMA Price, FY 2024 Q1 Forecast



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

Figure 11. Florida HMA Consumption, FY 2024 Q1 Forecast



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

CONCRETE

Summary

- According to the latest published data, cement production continued declining through June 2023, while prices rose significantly.
- A new fly ash source was announced during the quarter (in addition to those included in previous reports). While not a solution to short-term supply constraints, this could provide some relief to producers trying to secure material in the future.
- Labor and trucking were the two main issues highlighted by concrete producers during the quarter.

FDOT Impacts

- Weighted average concrete prices were up another 22% in the first quarter of FY 2024 compared to fiscal year-end 2023 costs.
- Cement and aggregate price increases, along with ongoing labor constraints, are keeping bids high.
- Current bids are tracking higher than the 6.8% increase forecasted as the best estimate of FY 2024 structural concrete prices. A decrease in concrete pricing is not expected at this time.
- The Summit Materials and Argos USA merger is expected to be completed early in 2024. This could affect competition from FDOT's perspective and further impact bids.

General Trends

The Portland Cement Association's (PCA) most recent outlook highlights that cement consumption in the U.S. continues being strong and that there is a lag in the impacts for cement consumption from a weaker private construction sector. As a result, they expect cement consumption in the U.S. will weaken in the first half of 2024 as they believe that gains seen in the public sector will not offset declines in the private sector. Industry reports show different projections of revenues for 2024, ranging from no growth to 2.5% growth. Quarterly results from publicly traded companies showed small declines in volumes with double-digit price increases. Interviews with FDOT producers confirm reported concrete price increases, with some quoting bid increases of at least 8% every 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 3 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 3. Structural Concrete Supply Chain Variables & Current Status		
	During Q2 of calendar year 2023, several publicly traded companies reported similar trends of declining volumes and rising prices. Year-over-year, prices had double-digit increases as high as 18%, while volumes declined as much as 8%. Heavier than expected rainfall and less demand from the residential sector were listed as the main factors. However, these small declines are from high quantities seen in 2022, so it doesn't necessarily mean a significant increase in availability. Producers expressed positive market outlooks and expect further price increases in 2023.	
Cement		
	Interviews indicated that aggregate availability, increased pricing, and transportation availability and costs continue causing issues for the industry. General issues are covered in the Aggregate section.	
Aggregate		
	Interviews indicated that availability has not changed, but prices have increased. Materials like sand are being used to supplement fly ash shortages. Eco Material Technologies and Georgia Power announced a new agreement that will allow the company to harvest 600,000 tons of fly ash per year from Plant Branch (coal-fired power plant retired in 2015). The announcement indicated that the fly ash will be used for customers in Florida and Georgia; a major announcement in this space.	
Fly Ash		
	As with other industries, producers had to deal with rail reliability issues this past year. In Q2 of calendar year 2023, overall tons and revenues of concrete products shipped by CSX increased by 10% and 18% year-over-year, respectively. As mentioned elsewhere in the report, the STB published a reciprocal switching proposal to address service issues.	
Rail		
	While diesel prices saw significant year-over-year declines earlier in 2023, they rebounded mid-year, increasing 35% since July 2023. As a result, prices were 1% higher in October 2023 compared to the same month in 2022. As mentioned in asphalt's supply chain table, it's expected that market costs will increase with UPS' new labor agreements, which may impact FDOT producers down the line.	
Truck		
	Producers continue reporting issues with finding skilled labor. As mentioned elsewhere in the report, statewide construction employment has slowed down. However, hourly construction wages in Florida were 7% higher year-over-year in September. A new AGC new survey showed that construction contractors in Florida continue struggling finding skilled labor, which has caused project delays.	
Labor		
	In October 2022, Summit Materials entered the Florida market with the purchase of SCI Materials in Ocala. However, in September 2023 Summit announced a deal to merge with Argos USA. It was reported that the deal will create the 4th largest cement and 6th largest aggregate producer in the U.S. Additionally, they would have a cement supply agreement from Argos' cement plant in Cartagena, Colombia. The deal is expected to be completed in the first half of 2024. While these deals were considered expansionary moves, the activity reduces some competition, potentially to the detriment of FDOT; industry consolidation within civil engineering has been rapid and aggressive since the pandemic, and the activity may be spreading to the contractor space.	
Competition		

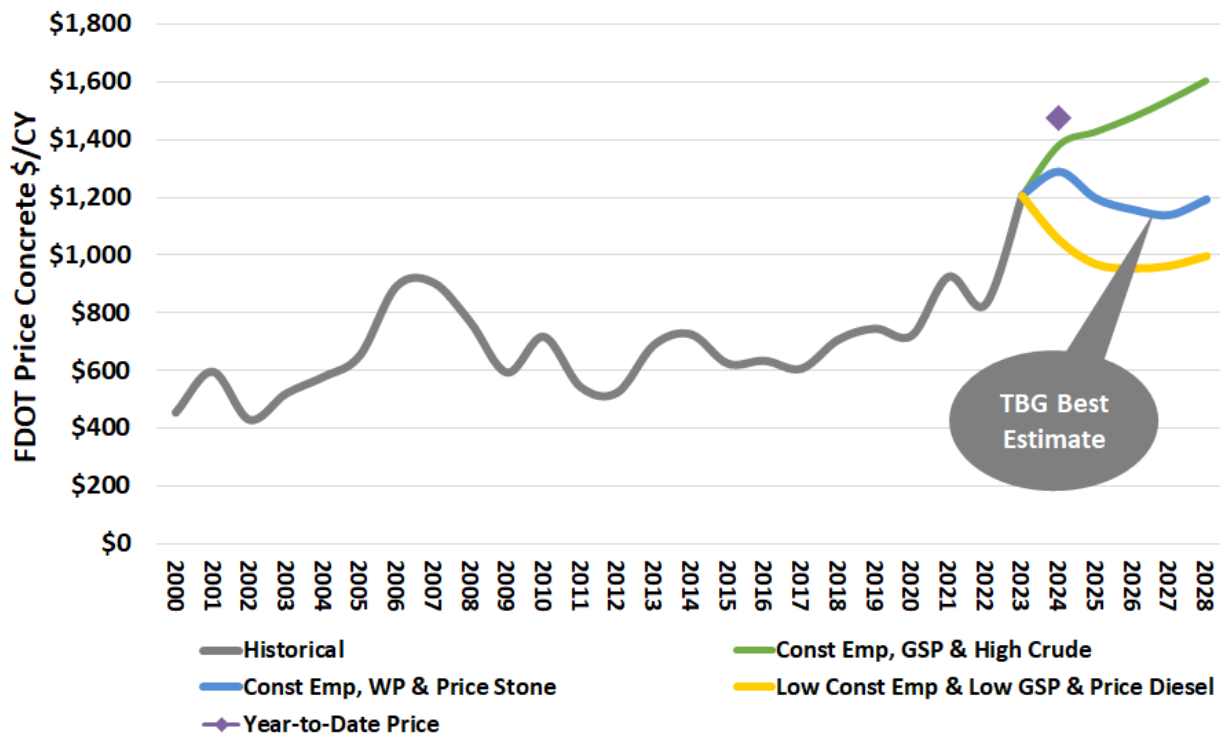
Concrete Forecast

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 4** provides the updated forecast average price for concrete. The current forecast is within 1% of previous estimates and is tracking closely with year-to-date bid results. The best estimate of concrete prices reflects the impact of work program demand, higher aggregate costs, and ongoing skilled labor constraints (**Figure 12**). A lower bound reverts to pre-pandemic conditions, with flat diesel prices, lower Florida macroeconomic activity, and declines in construction labor. The upper bound reflects continued growth in GSP, rebounding construction employment, and higher crude prices. **Figure 13** shows the output of several quantity models forecasting statewide consumption of concrete and the scenario identified as the best estimate.

Fiscal Year	2023	2024	2025	2026	2027	2028
Price Concrete, \$/CY	\$1,206	\$1,289	\$1,196	\$1,157	\$1,139	\$1,193
Annual Percent Change, %	45.3%	6.8%	-7.2%	-3.2%	-1.6%	4.7%

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

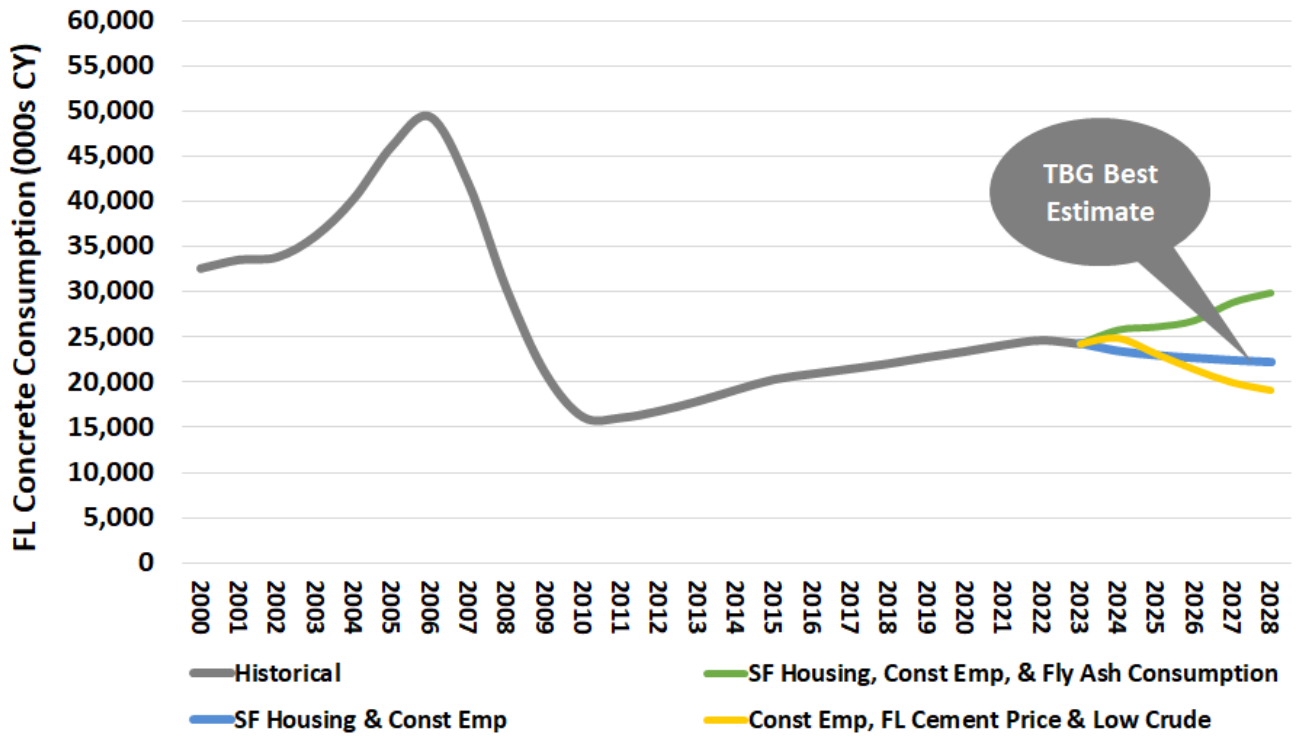
Figure 12. FDOT Concrete Price, FY 2024 Q1 Forecast



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

(Variable descriptions available in the **Appendix**.)

Figure 13. Florida Concrete Consumption, FY 2024 Q1 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 continue to decline through the end of the quarter, but started increasing again in early October 2023.
- Global steel costs, including quotes from China and western Europe, continued declining through the end of Q1 FY 2024. World hot rolled band costs were 28% lower than comparative U.S. prices in October 2023.
- Lead times have improved for many products, but specialty products are still lagging in recovering pre-COVID times. Skilled labor retention remains an ongoing issue for producers.

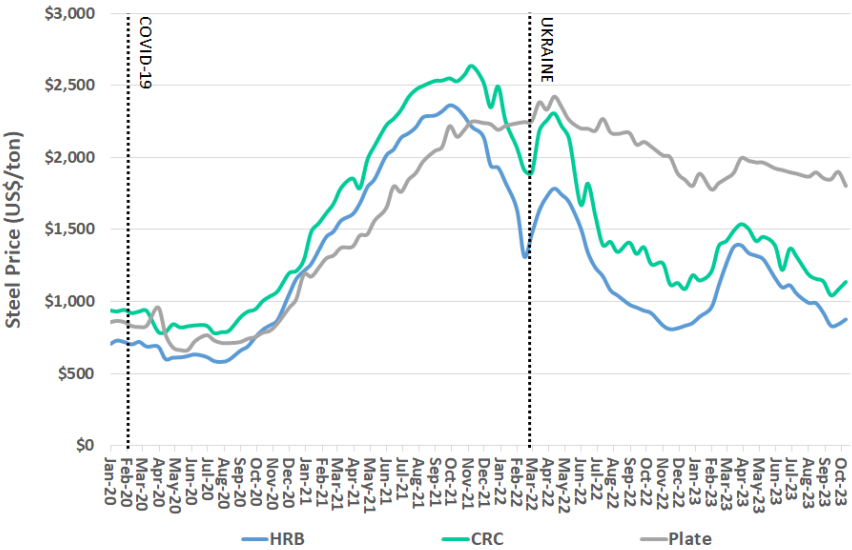
FDOT Impacts

- Structural steel bids are up 2.4% in Q1 FY 2024, tracking close to the 1.8% forecasted.
- Reinforcing steel price increases have slowed, rising only 1% so far in FY 2024. Forecasts currently expect a decline by year-end.
- Producers are optimistic that major price increases have subsided and expect only moderate fluctuations from current pricing through the next quarter. Some FDOT fabricators report reducing bid prices to remain competitive in the market.

General Trends

U.S. steel prices continue to decline, with brief bouts of small increases. However, the rate of change varies greatly by product (**Figure 14**). U.S. hot-rolled band prices increased slightly in October 2023 after several months of declines, but were still 7% lower than October 2022. Cold-rolled coil prices and steel plate were also down 16% and 11% year-over-year, respectively.

Figure 14. U.S. Steel Pricing, Jan. 2020 – Oct. 2023



Source: AISI Weekly Raw Steel Production.

In its October 2023 Short Range Outlook, the World Steel Association (WSA) expects worldwide steel demand to increase 1.8% in 2023 (down from 2.3% forecasted in April 2023) and 1.9% in 2024 (up from 1.7%). For the U.S., the WSA now expects a decline of 1.1% in steel demand in calendar year 2023 (down from 1.3% growth), highlighting tight monetary policy and suppressed residential construction demand. For 2024, WSA expects U.S. steel demand to increase by 1.6%.

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

Table 5. Supply Chain Variables for Structural Steel		
 Raw Materials	Prices for hot-rolled steel decreased 9% in October 2023 year-over-year. While prices increased for most of the first half of 2023, they have been decreasing slowly in the second half of 2023. Rebar prices have been decreasing slowly from the beginning of 2023, declining 26% in June 2023, year-over-year. Iron ore prices declined 17% over the same period. Interviews indicated lower prices and improved lead times are expected to continue.	
 Scrap Steel	Despite some month over month declines, U.S. scrap steel prices increased 8% in October 2023 compared to the same month in 2022. However, one fabricator reported a 30% decline in scrap prices from their supplier over the last few months. While scrap prices are still high, some moderation is occurring in the market.	
 Galvanizing	Global zinc prices decreased 20% in September 2023 compared to the same month in calendar year 2022. Interviews indicated lower prices, but shortages and high lead times for galvanized steel products, like light poles and pedestrian signals. Lead times for poles were reported around 30 weeks.	
 China	Chinese steel prices have decreased slightly after a 11% increase in August 2023 from the prior month. As of September 2023, prices in 2023 declined 9% to an average of \$524 per ton, a 6% decline year-over-year. While Chinese production was down a few months ago, as of August 2023, production rose by 3.2% compared to the same month in 2022.	
 Transportation	Overall costs for producers remain higher than in the past. While diesel prices had significant year-over-year declines earlier in 2023, they saw a 35% increase since July 2023. As a result, in October 2023 they were 1% higher year-over-year. As mentioned in asphalt's supply chain table, is expected that competition and costs will increase with UPS' new labor agreements, which would represent increased costs for producers.	
 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	Year-to-date production through October is down 1.1% to 70.2 million net ton and capacity utilization is at 75.9%. Mills' decisions to idle or restart plants have caused disruptions in production and prices for producers. For example, US Steel idled the remaining active blast furnace at its Granite City mill in response to the United Auto Workers strike. Argus estimated that US consumption of flat steel, other steel and aluminum could decline by as much as 409,000 st, 138,200 st and 134,300 st per month, respectively. As a result, producers expect an increase in prices after the strike. These types of events negatively affect FDOT's costs.	
 Labor	Producers continue struggling to find skilled labor and this has prevented some from increasing production. Producers continue reporting issues with finding skilled labor. As mentioned elsewhere in the report, statewide construction employment has slowed down, while wages have gone up. A new survey showed that construction contractors in Florida continue struggling to find skilled labor, which has caused project delays.	
 Competition	Reports indicate that U.S. Steel is up for sale and that Cleveland-Cliffs and Esmark have submitted formal bids. Additionally, it was reported that the European company ArcelorMittal is also considering bidding. It is unclear what will happen as some organizations have expressed concerns over competition in the industry with the sale. Supply and prices will continue to be affected by what happens in other sectors of the economy.	

Steel Survey

The most recent survey of FDOT steel fabricators finds that price changes trended downwards in September 2023 (**Table 6**). These declines are expected to continue through October 2023. The almost across the board price decreases indicate a positive outlook for many segments of the steel markets. Structural steel costs are expected to increase slightly by the end of the next quarter, however. Fabricators expect structural steel production to ramp up in Q2 FY 2024.

Table 6. October Steel Producer Survey Results

Material	Structural Steel	Steel Plate	Steel Pipe	Square Tubing	Steel Railing	Galvanizing
Price Change, September 2023	0.0%	-2.5%	-2.5%	-2.5%	-2.5%	0.0%
Expected Price Change, October 2023	0.0%	-2.5%	-2.5%	-2.5%	-2.5%	0.0%
Expected Price Change Next Quarter (End of Dec.)	2.7%	-2.5%	-2.5%	-2.5%	-2.5%	0.0%
Bid Price Change, September 2023	0.0%	-2.5%	-2.5%	-2.5%	-2.5%	0.0%
Production Change, September 2023	2.5%	N/A	N/A	N/A	N/A	N/A
Expected Production Change, October 2023	8.0%	N/A	N/A	N/A	N/A	N/A
Expected Prod. Change Next Quarter (End of Dec.)	13.0%	N/A	N/A	N/A	N/A	N/A

Source: TBG Work Product.

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 7** provides the forecast average price for structural and reinforcing steel.

Previous structural steel forecasts were about 1% higher than the current best estimate model. With updated projections across raw material prices and macroeconomic conditions, the best estimate of structural steel costs was driven by iron and zinc prices and GSP. Both commodities are forecast to fluctuate in the short-term, but flatten over the five-year work program, while GSP reflects strong annual growth (about 4.4% on average). In the lower bound, flatter commodity prices restrain price growth. In the upper bound, coal prices, which are a driver for steel manufacturing, and higher economic growth in Florida support ongoing price increases. Q1 FY 2024 structural steel prices are tracking close to the best estimate at this writing.

Table 7. FDOT Structural Steel Price Forecast Results

Fiscal Year	2023	2024	2025	2026	2027	2028
Price Structural Steel, \$/lb.	\$3.51	\$3.58	\$3.67	\$3.88	\$4.11	\$4.36
Annual Percent Change, %	-21.4%	1.8%	2.5%	5.8%	6.0%	6.1%

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

Updated reinforcing steel weighted average price forecasts are about 4% higher than previous estimates with updated data (Table 8). Reinforcing Steel price increases have slowed but remain at peak levels compared to historical values. The best estimate currently predicts a decline in pricing for FY 2024, with continued construction employment constraints and medium crude oil price moving price growth to more long-term historical trends. The lower bound is supported by lower input prices, while the upper bound takes continued Florida GSP growth into consideration.

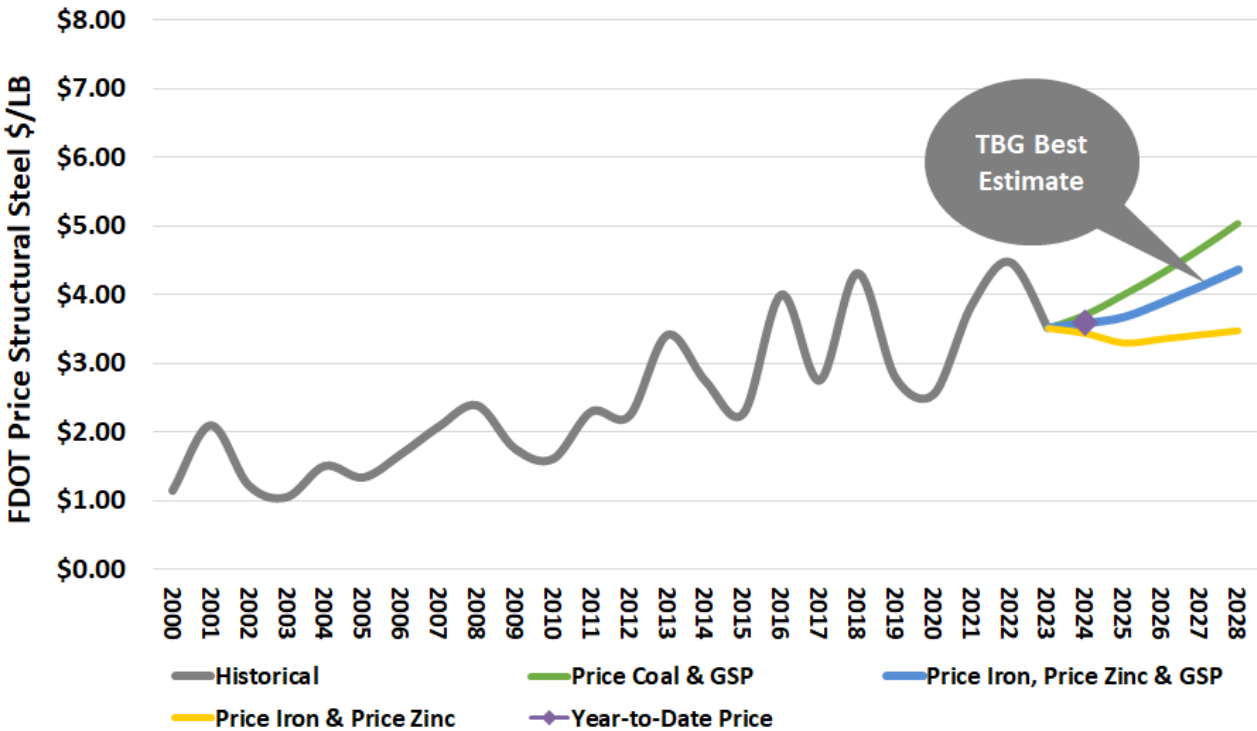
Table 8. FDOT Reinforcing Steel Price Forecast Results

Fiscal Year	2023	2024	2025	2026	2027	2028
Price Reinforcing Steel, \$/lb.	\$1.52	\$1.40	\$1.41	\$1.42	\$1.44	\$1.48
Annual Percent Change, %	2.2%	-8.2%	1.0%	0.3%	1.8%	2.4%

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

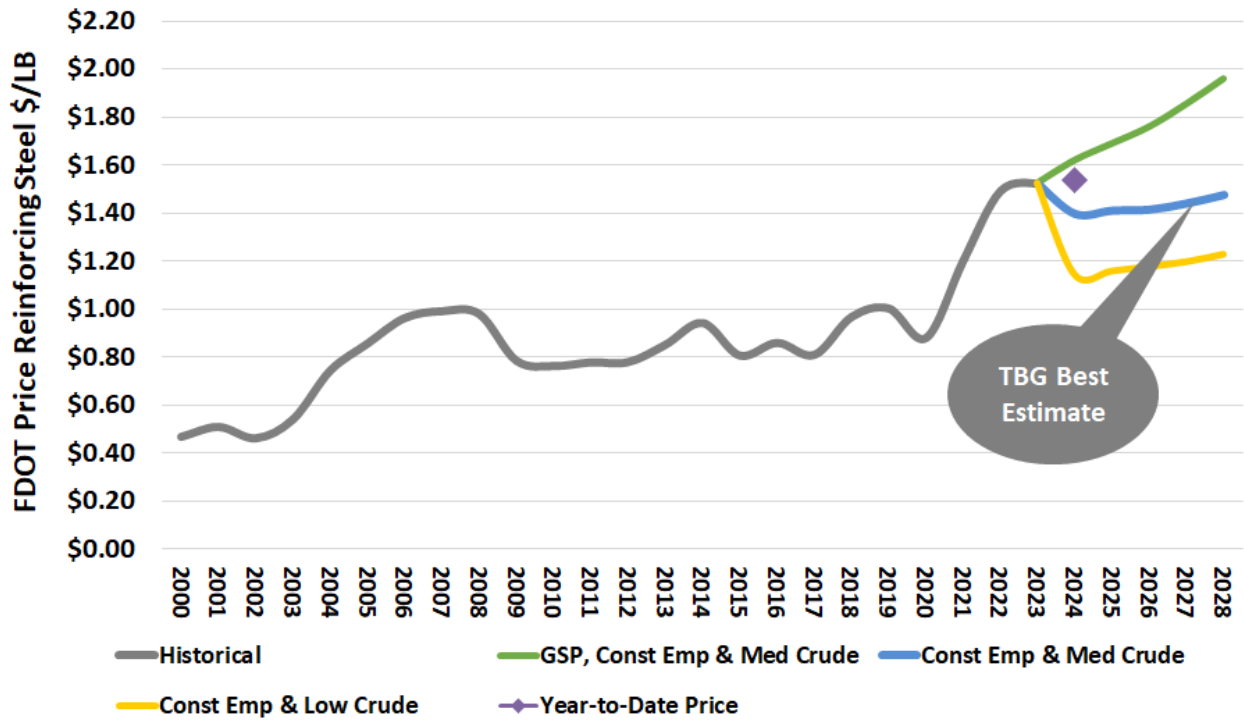
Figure 15 and Figure 16 show the output of several price models and the scenario identified as best estimate for structural steel and reinforcing steel, respectively.

Figure 15. FDOT Structural Steel Price, FY 2024 Q1 Forecast



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

Figure 16. FDOT Reinforcing Steel Price, FY 2024 Q1 Forecast



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

AGGREGATE

Summary

- Demand for aggregate materials remains high and is expected to continue throughout FY 2024. However, production in Florida declined slightly through June 2023 according to the latest available data.
- Double-digit price increases occurred as expected over the summer. While expected to moderate in FY 2024, mid-year increases could become the norm in the industry.
- Demand for public infrastructure and non-residential construction (such as resiliency) remains strong. Slowdowns in the residential sector are not expected to provide relief.




FDOT Impacts

- FDOT's aggregate base prices soared in Q1 FY 2024 with a statistically significant number of bids. Aggregate bids should be closely monitored next quarter.
- FY 2024 bids are currently forecast to increase by 8.7% compared to FY 2023, which saw double-digit increases due to expected supplier price hikes.
- Additional sources of aggregates are being reviewed to increase imports and alleviate supply constraints and bottlenecks. BABA import restrictions officially do not apply to aggregate construction materials.

General Trends



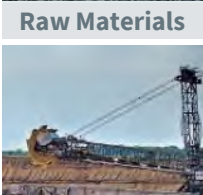



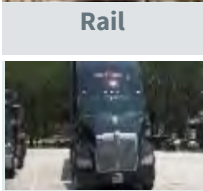

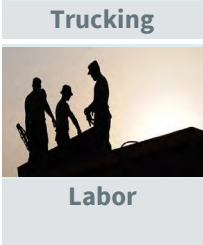

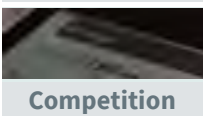

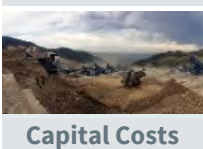

According to quarterly data released by the USGS, crushed stone production in Florida for the second quarter of calendar year 2023 was down 1.4% year-over-year. Year-to-date production was flat at 53.4 million tons. This was slightly lower than the national growth, which was 1%. Quarterly reports from publicly traded companies showed that in the second quarter of calendar year 2023, aggregate shipments for different regions were down by as much as 6%. They continued highlighting the softening of the residential sector (especially multi-family) and the industrial sector (especially warehousing) to explain the decline. Public and non-building infrastructure continues being the strongest sector. Dodge & Data Analytics forecasts that U.S. demand of aggregates in 2024 will increase by 8% and other industry reports show a 4% increase in revenues in the nonmetallic mining industry for 2024.

Prices from publicly traded companies continued showing significant increases (between 15% and 20%). For 2024, while they haven't indicated specific ranges, in Vulcan's call they expect high single-digit increases. Increases would take effect in January and it's uncertain if there will be mid-year increases, but it will become the norm to have the discussions.

	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 9 provides current status of selected supply chain variables.

Table 9. Aggregate Supply Chain Variables		
	The USGS reported that Florida's crushed stone production decreased 1.6% during the second quarter of calendar year 2023 compared to the same period in 2022. Nationally, production declined 0.2% in the second quarter. As expected, prices from publicly traded companies showed significant year-over-year increases - between 15% and 20%. Interviews indicated smaller price increases (10%).	
	Access to land with suitable deposits is key to cost-effective material extraction for FDOT Aggregate. As mentioned elsewhere in the report, the new WOTUS rule went into effect on September 8 th , but is being challenged by construction and transportation organizations. Uncertainty in the industry is expected to continue.	
	Rail is the primary transportation for aggregates from Georgia, and from Lake Belt to Central and Northeast Florida. In the second quarter of calendar year 2023, tons and revenues of aggregate products shipped by rail increased by 7% and 10% year-over-year, respectively. However, these statistics are for CSX's whole system as location specific data is not available.	
	Trucking continues being an issue. Anecdotally, interviews indicated that costs were up 25% year-over-year. Fuel prices were on the rise once again. Diesel prices saw a 35% increase since July 2023 and in October 2023 they were 1% higher year-over-year. As mentioned in asphalt's supply chain table, UPS' new labor agreements may impact competition for drivers and increase costs for producers in other sectors.	
	Producers continue reporting issues with finding skilled labor and they indicated they worsened. As mentioned elsewhere in the report, statewide construction employment has slowed down, while wages have gone up. A new survey showed that construction contractors in Florida continue struggling finding skilled labor, which has caused project delays. Interview also expressed concern over the current labor supply, as well as the skilled labor pool worsening over the last quarter and year.	
	As mentioned in previous reports, it was expected that new sources of aggregate from Canada were going to be available and these mines are now under review in FDOT's approved producer list.	
	Federal interest rates are expected to remain above 5% through June 2024, increasing acquisition costs of equipment and vehicles, and increasing the long-term cost of building construction.	

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.

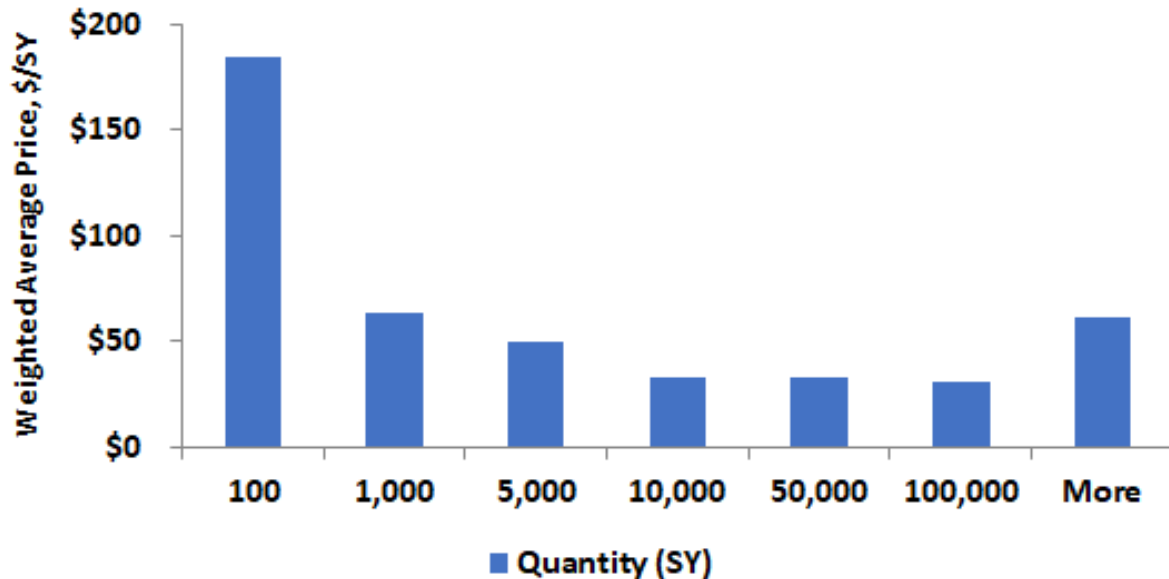
Table 10 provides the forecast average price for aggregate base.

Fiscal Year	2023	2024	2025	2026	2027	2028
Price Aggregate Base, \$/SY	\$26.32	\$28.62	\$26.58	\$25.89	\$25.62	\$26.93
Annual Percent Change, %	13.9%	8.7%	-7.1%	-2.6%	-1.0%	5.1%

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

Updating the forecast model with current input cost projections, results in only a 1% adjustment to previous forecasts. However, current quarter bids exceed modeled forecasts across quantities (**Figure 17**), and are not supported by either historic bidding behavior nor current input costs. Bidding behavior may moderate throughout the remaining fiscal year to more closely resemble input costs and competition, but given bidder success, FDOT may need to adapt to much higher costs.

Figure 17. Current Quarter Aggregate Bids

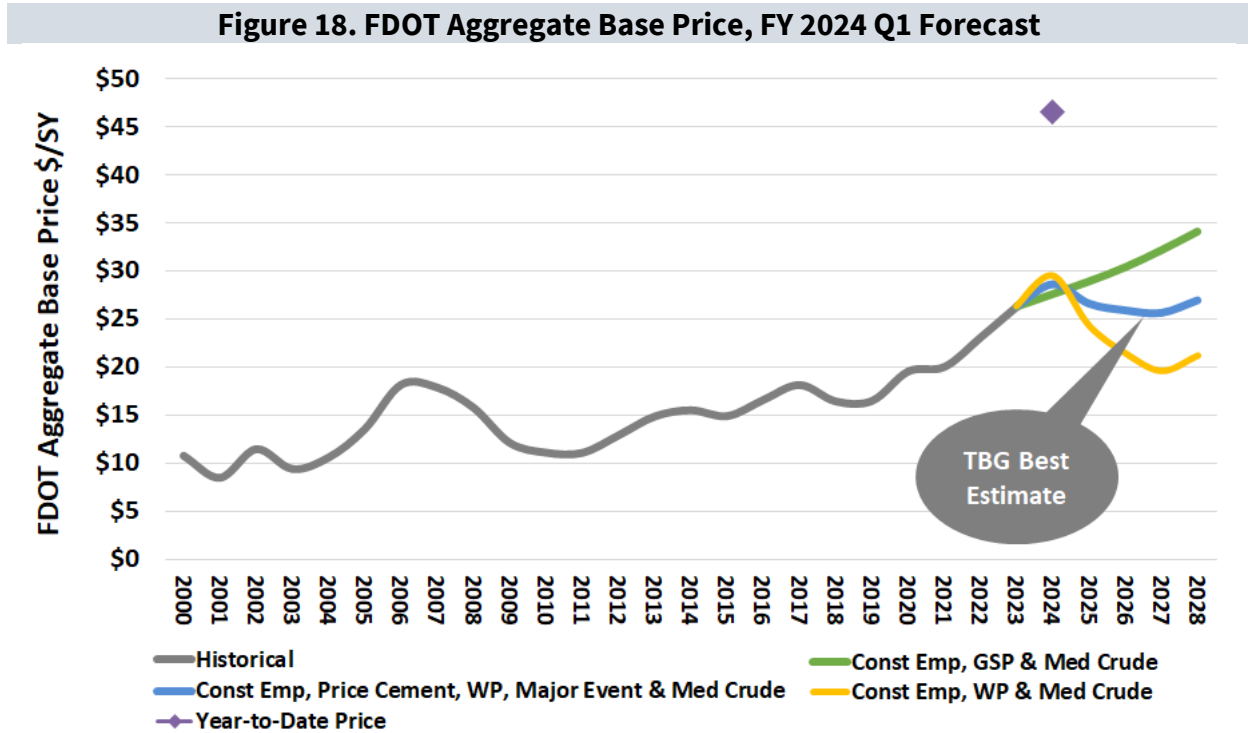


Source: Source: TBG calculated from data provided by FDOT Estimates Office; n = 77.

The best estimate model considers construction employment growth, cement and crude oil pricing, FDOT work program funding, and major events into account, supporting prices above \$25 per square yard through FY 2028 despite a slight decline in the outer years. The lower bound model would yield aggregate base prices closer to historical norms throughout the five-year work program, but still above pre-pandemic levels. The upper bound includes

unconstrained economic growth and medium energy costs, resulting in much higher prices than seen historically.

Figure 18 shows the output of several price models and the scenario identified as best estimate for aggregate base.



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

EARTHWORK

Summary

- Truck driver employment in Florida continues to increase, although drivers are still in short supply.
- While diesel prices declined earlier in calendar year 2023, the significant increases seen since the summer have increased costs for contractors once again.
- Equipment and truck costs continue being lower year-over-year and rentals have become more popular as producers try to mitigate risk.

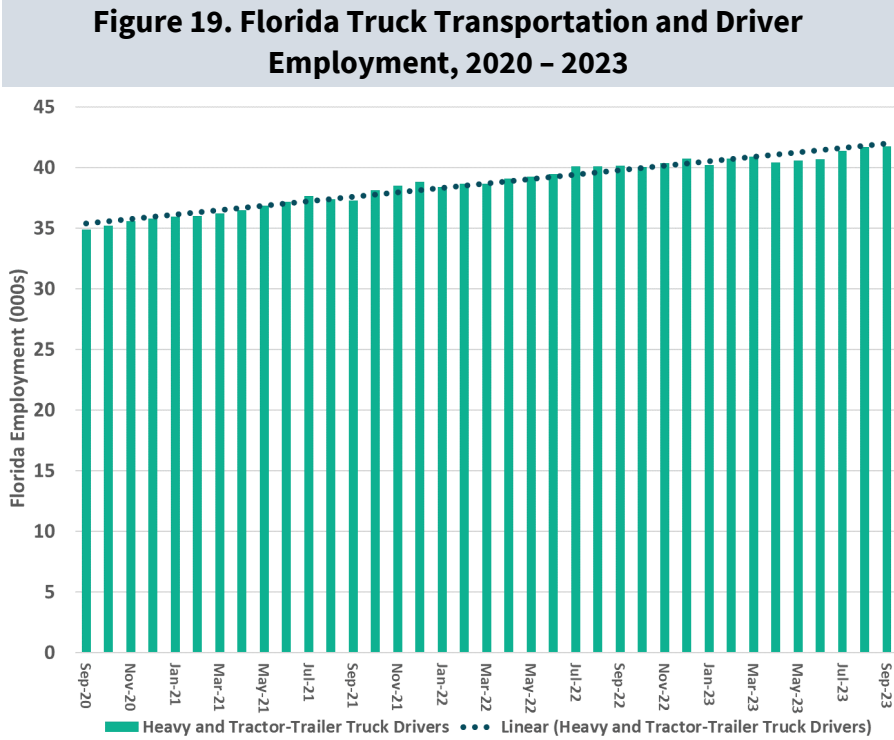
FDOT Impacts

- Cost declines seen in FY 2023 may be short lived as earthwork related bids in Q1 FY 2024 more than doubled for some pay items.
- Current pricing is overshooting the -5.1% forecast decline for 2024. This situation should be closely monitored next quarter as other state DOTs also report rapidly increasing earthwork costs.

General Trends

Overall truck transportation employment continues with the steady growth seen earlier in 2023. In September 2023, employment rose 4%, year-over-year. Heavy and tractor-trailer truck driver employment, which accounts for approximately 57.8% of truck transportation according to BLS, has followed an upward trajectory for most of 2023 (Figure 19). As mentioned throughout the

report, industry expectation is that driver availability could be put under more pressure with UPS' new labor agreement. Additionally, diesel prices rose significantly since July 2023. These two factors can increase producers' costs, which could negatively impact FDOT's costs.

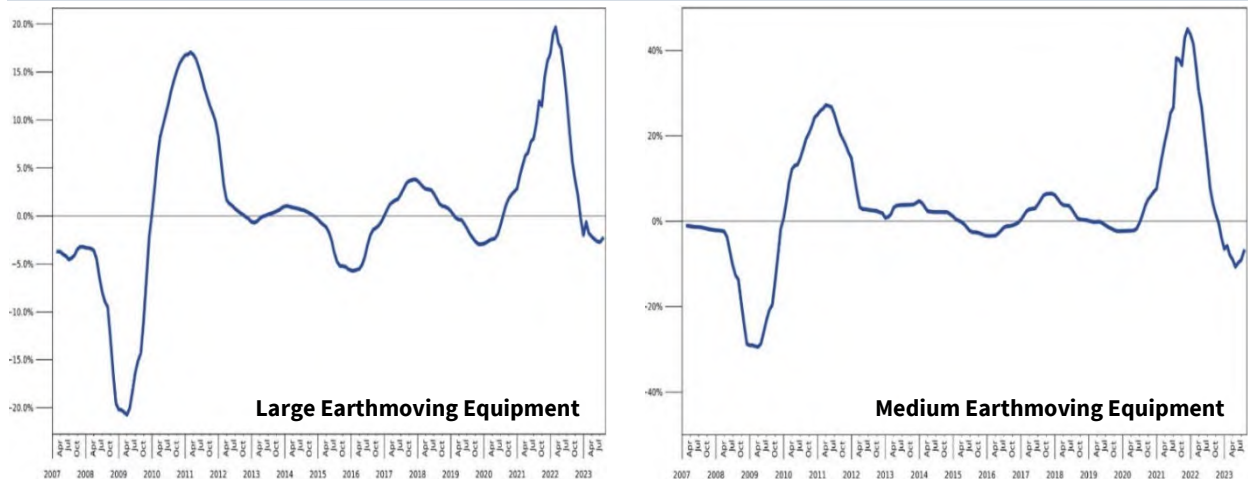


Source: TBG work product, BLS.

Equipment

The September 2023 used equipment market trends report released by Ritchie Bros. shows that prices for used large and medium earthmoving equipment have stabilized in recent months after continued declines. Large and medium earthmoving equipment fell 2% and 7% year-over-year, respectively (**Figure 20**).

Figure 20. 3-Month YoY Change in Price Indexes for Large and Medium Earthmoving Equipment

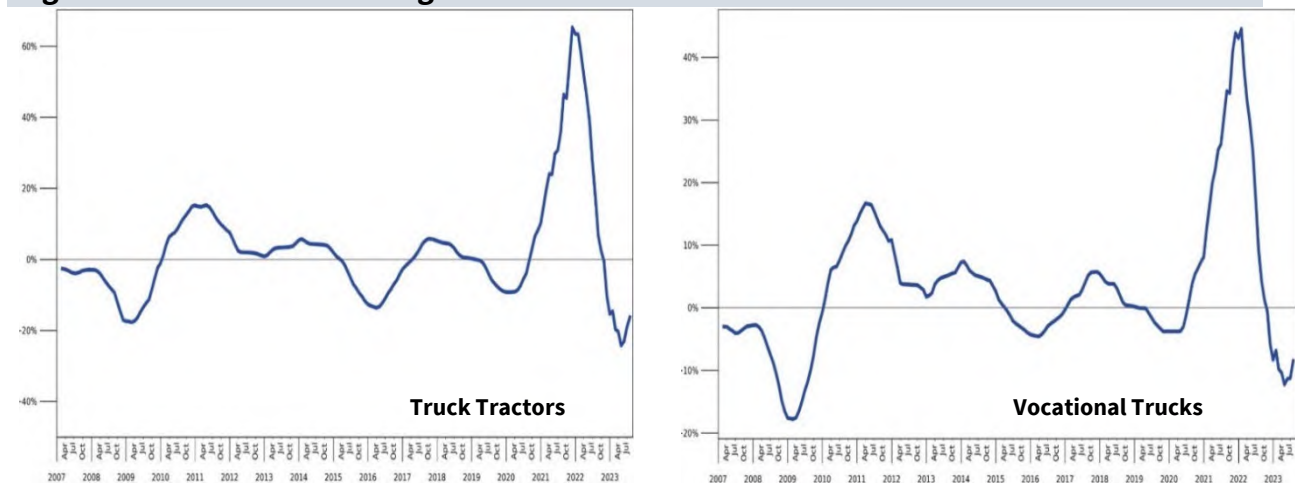


Source: Ritchie & Bros. Used Equipment Market Report.

Trucking

Used truck prices increased last quarter after significant declines earlier in the year. The 3-month average costs of truck tractors and vocational trucks were down 16% and 8% year-over-year, respectively (**Figure 21**).⁴ Reports indicate that rentals have become more popular as contractors try to mitigate risks of a downturn in the economy and increased interest rates.

Figure 21. 3-Month YoY Change in Price Indexes for Truck Tractors and Vocational Trucks



Source: Ritchie & Bros. Used Equipment Market Report.

⁴ 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 11** provides the forecast average price for earthwork. **Figure 22** shows the output of potential price models and the scenario identified as best estimate for earthwork.

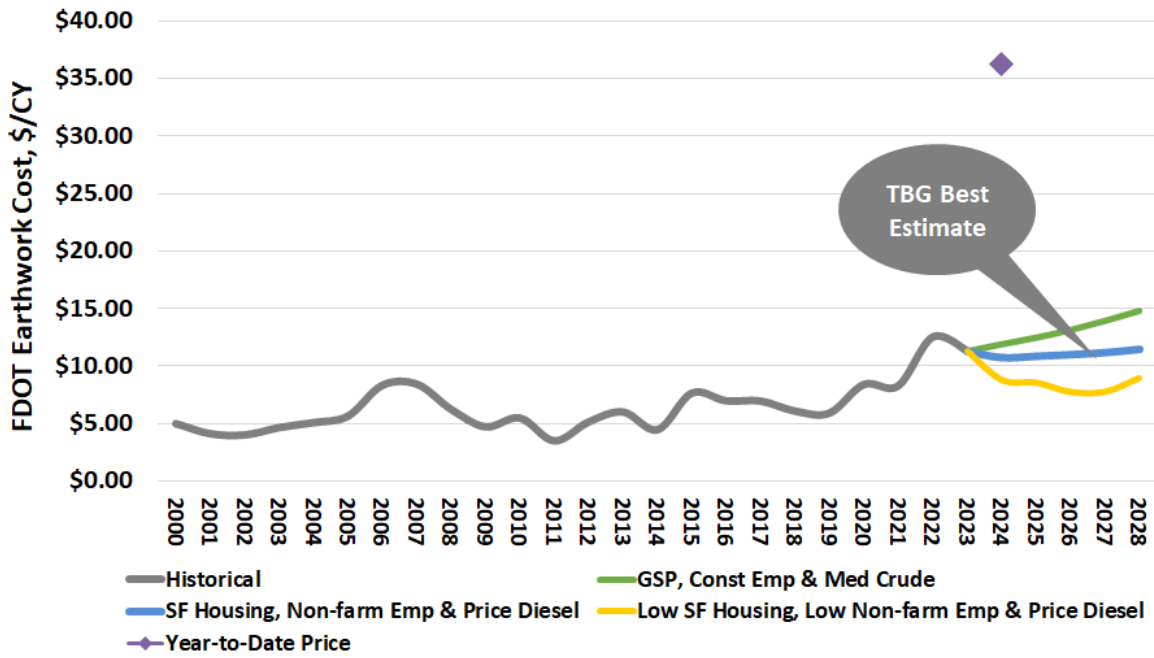
Current bidding activity has unusual patterns. Small unit jobs drove the very high bids, with 40 projects under 1,000 cubic yards at a weighted average price of \$61 per cubic yard. Averaging all jobs over 1,000 cubic yards, the average unit cost drops to \$18, but only if excluding one bid for \$59 million on 1.2 million cubic yards. \$18 per cubic yard is still very high by historic standards and warrants close monitoring over the coming quarter. Excluding all the unusual bids, it appears that bidding activity has now jumped to the upper bound trajectory, and projects with very high or low earthwork quantities are likely to see premiums embedded in earthwork prices. For forecast purposes, the next quarter will be telling as to whether FDOT can anticipate bids moderating to the best estimate line, or if they're stuck closer to the upper bound.

Current earthwork forecasts are 2% higher than previous estimates. With updated economic and fuel data, the best estimate projects moderating earthwork costs, but does not see bids returning to pre-pandemic levels throughout the five-year work program. Continued infrastructure funding is at odds with construction labor availability, so it's unlikely earthwork costs will fall dramatically in the short-term. In the lower bound, recessionary conditions would drive down costs, while the upper bound is driven by strong economic growth, fuel costs, and industry demand.

Table 11. FDOT Earthwork Price Forecast Results						
Fiscal Year	2023	2024	2025	2026	2027	2028
Price Earthwork, \$/CY	\$11.31	\$10.74	\$10.86	\$11.01	\$11.19	\$11.49
Annual Percent Change, %	-9.5%	-5.1%	1.1%	1.4%	1.6%	2.7%

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

Figure 22. FDOT Earthwork Price Estimates, FY 2024 Q1 Forecast



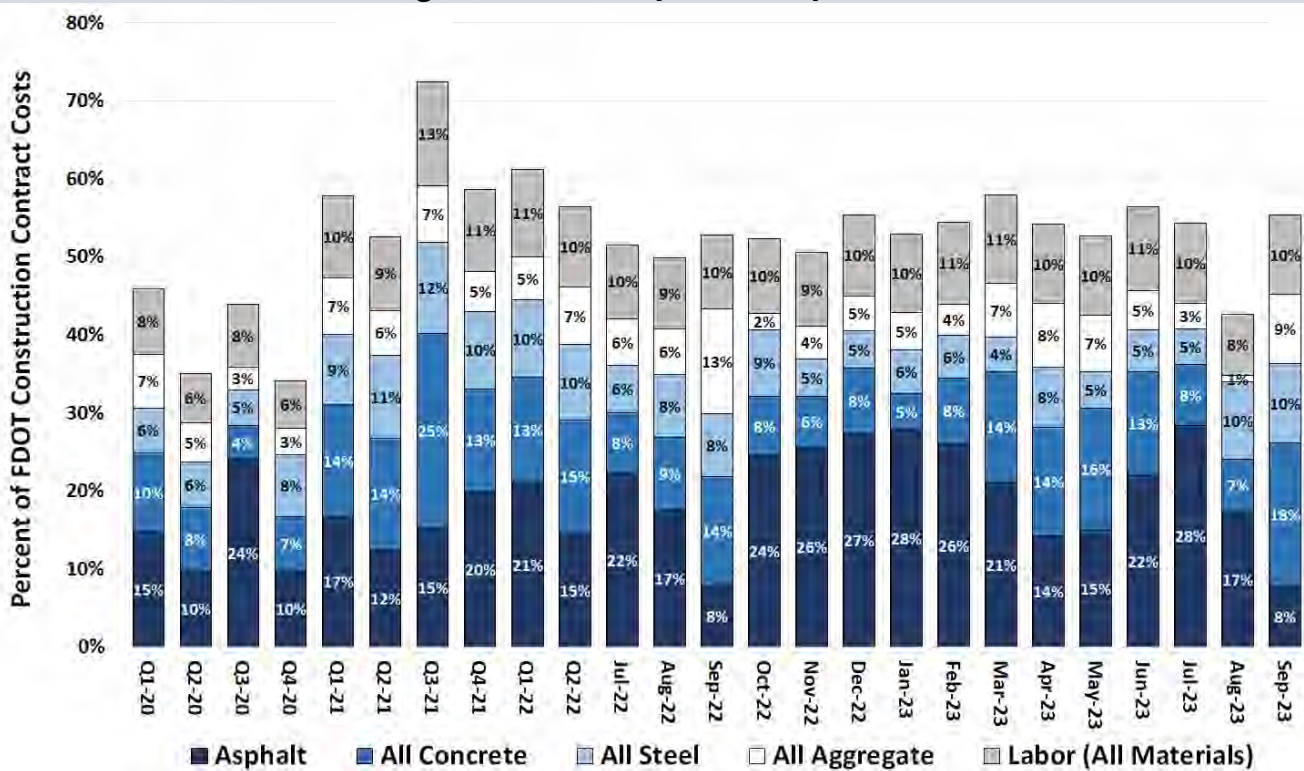
Source: TBG calculated from data provided by FDOT Estimates Office, various industry sources.
 (Variable descriptions available in the **Appendix**.)

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, which usually maintain the historical majority of total dollars, were the lowest share of total costs in September 2023 according to preliminary data. Concrete and steel costs as a share of total costs were high in September 2023 compared to previous periods. Aggregate costs as a share of total costs increased as well according to the latest bid data. Despite recent wage increases in the industry, labor costs have remained stable over the last few months at about 10% of total costs.

Figure A- 1. Monthly Cost Composition

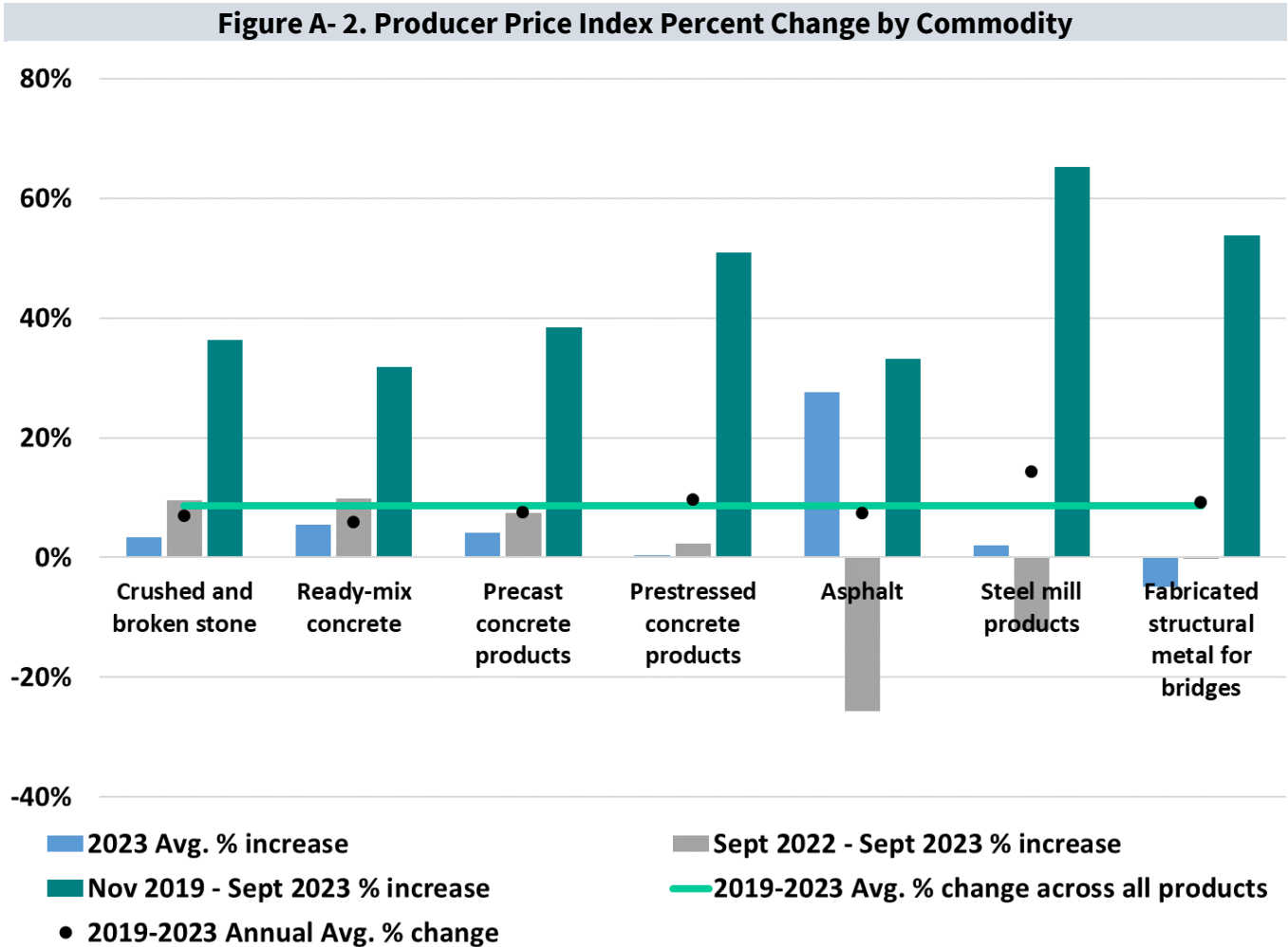


Source: TBG calculated from data provided by FDOT Estimates Office.

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 2.3% average increase has been seen across most commodities in calendar year 2023 (blue commodity bars in the graph), with asphalt seeing the largest change (27.6%). Structural metal for bridges declined 4.9% over the same period. Year-over-year changes are indicated by the grey commodity bars in the graph, with crushed stone, ready-mix, and precast prices increasing by 9.6%, 9.4%, and 7.4% in the

U.S., while asphalt (refinery production), steel mill products, and structural metal for bridges all declined by 25.7%, 12.1%, and 0.3%, respectively.⁵



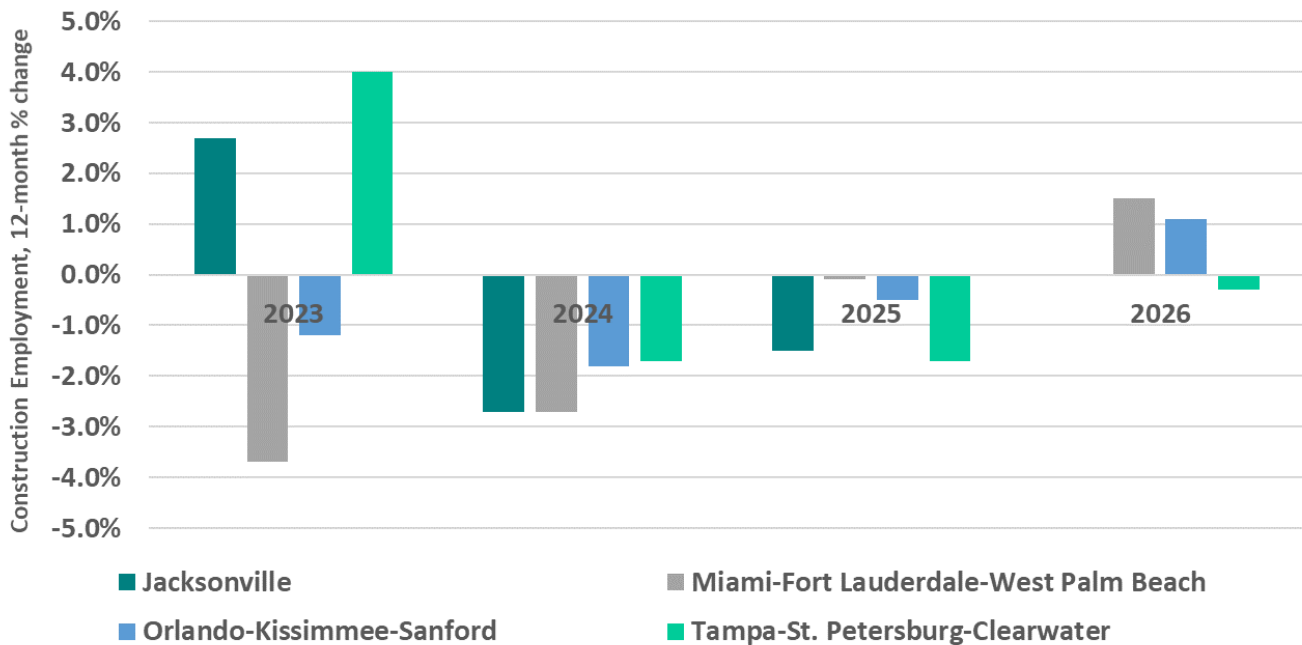
Source: BLS (Producer Price Index, not seasonally adjusted); TBG Work Product.

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, declining from the previously reported 4% increase in 2022. 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%. At the metro level, IEF projects construction employment declines in most major markets throughout the forecast period, with the largest overall losses seen in 2023 and 2024 (**Figure A- 3**).

⁵ 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.

Figure A- 3. Historical and Forecasted Changes in Employment in Major Florida Markets, 2022 - 2026

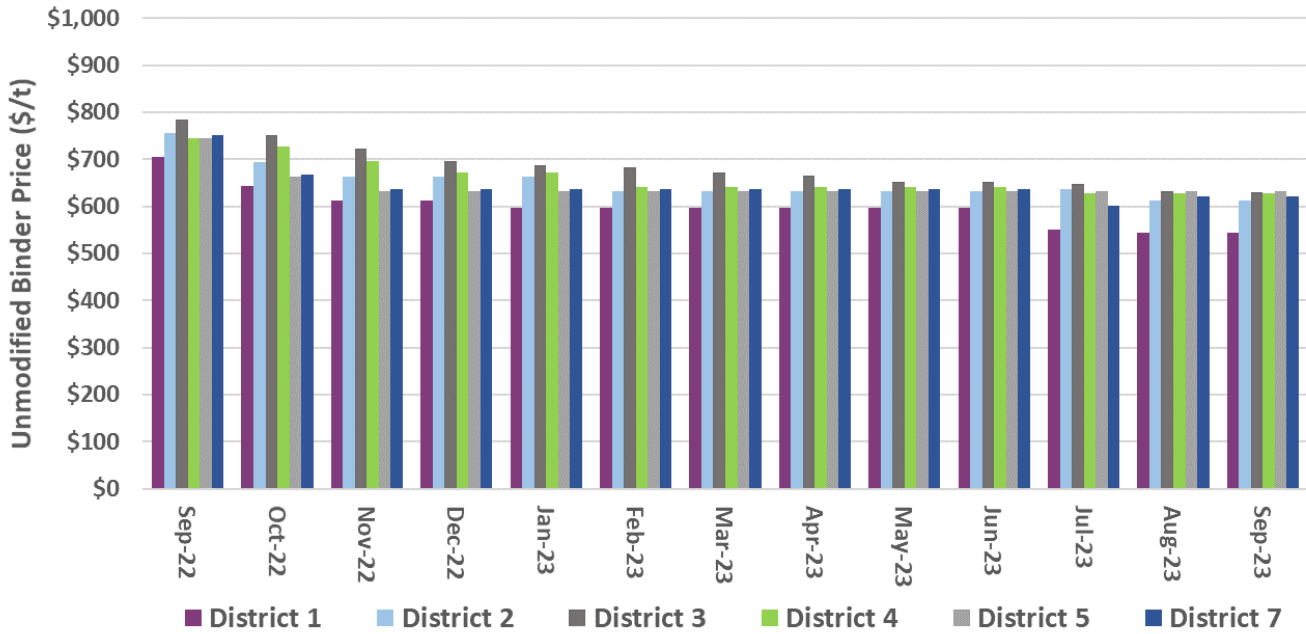


Source: UCF Institute for Economic Forecasting Winter 2023 Florida & Metro Forecast.

Binder Prices by District

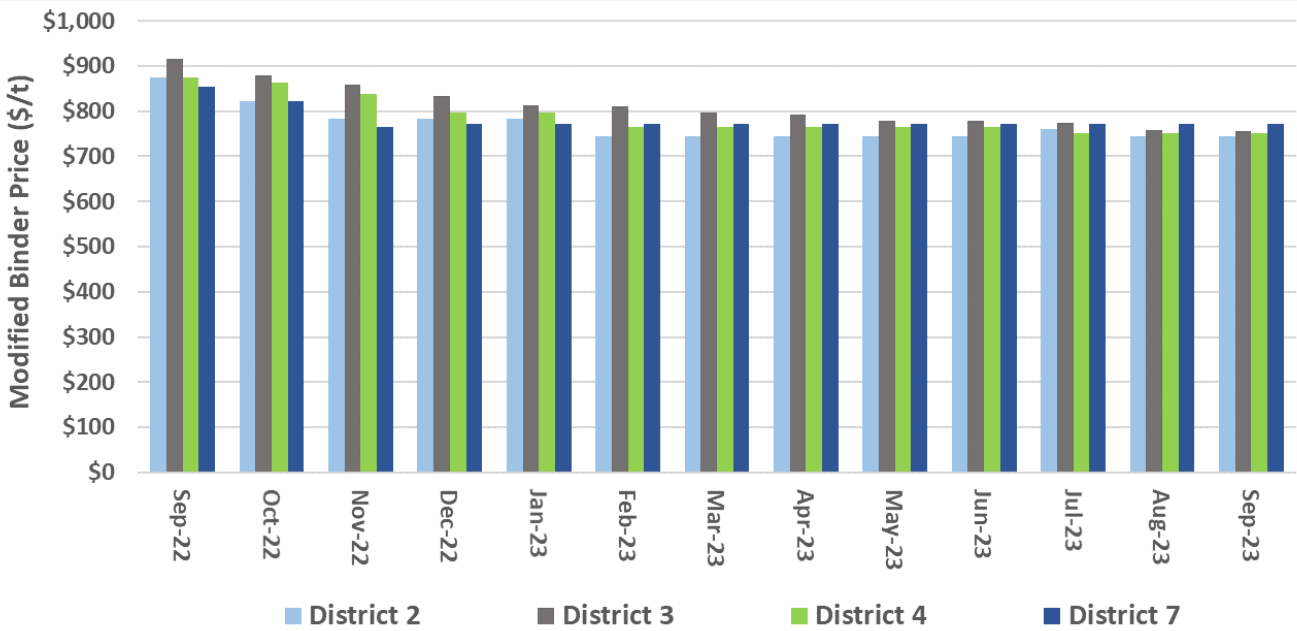
Where available, the average prices for unmodified (**Figure A- 4**) and modified (**Figure A- 5**) binder were calculated from monthly terminal price quotes at the district level. Unmodified binder is the average of PG 52-28 and PG 58-22 prices, while modified binder is a quote for the price of PG 76-22 (PMA) in the dataset. Unmodified binder prices fell in all districts between 17% and 23% year-over-year. Since January 2023, prices in Districts 2, 3 and 4 decreased between 7% and 10%; in District 7 they decrease 2%, but they were flat in District 5. Modified binder prices show similar patterns, with prices decreasing in all district between 10% and 17% year-over-year. Prices in Districts 2, 3, and 4 showed similar declines between 5% and 7% since January 2023, while they were flat in District 7.

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**.

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](#)⁶, 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.

⁶ Main page: <https://www.fdot.gov/programmanagement/estimates/documents/sresreports>

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