NORTH CAROLINA
Department of Transportation









# Building a Best-in-Class DOT

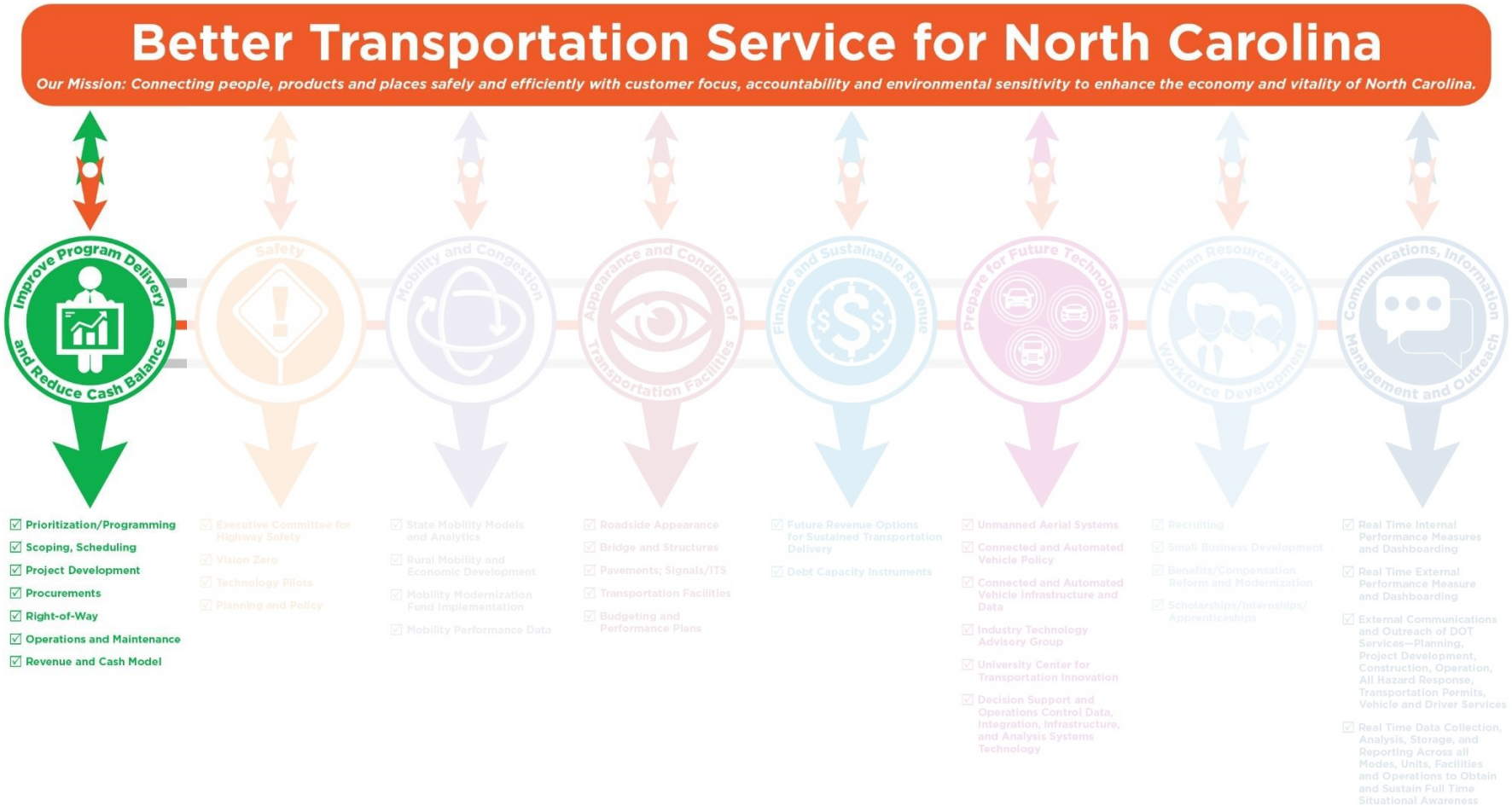
**DRAFT AND CONFIDENTIAL – NOT FOR DISTRIBUTION**

**September 2019**

## Contents for discussion today

1. **What happened** with cash reserve levels over the past decade?
2. **Why did the cash position fall** more than the forecast in FY19?
3. **What is NCDOT doing** to prevent variances going forward?
4. What **support does NCDOT need** from others going forward?

# 1 The strategic objectives of NCDOT include the need to reduce and right-size cash balance

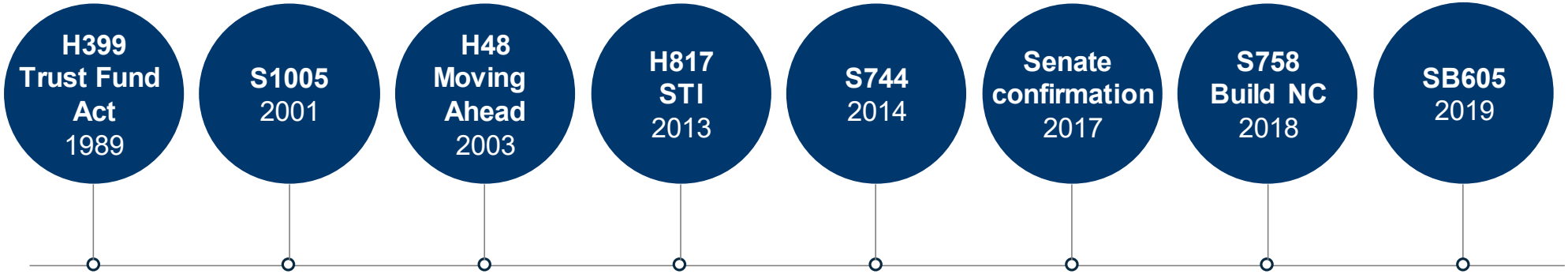


# 1 NCDOT today operates in a more complex environment, with a smaller staff, than it did just 10 years ago

| Key trends | Past NCDOT | | NCDOT today | | NCDOT 2030+ |
|---|---|---|---|---|---|
| Larger projects[1] | ▪ FY07 **Projects >$10M: 56%** of let spend | ↑ | ▪ FY19 **Projects >$10M: 87%** of let spend | ↑ | ▪ FY23-25: **Projects >$10M: >90%+** of let spend |
| More complex contracting | ▪ **DB is 6 – 23%** of construction spend FY09 – FY11 | ↑ | ▪ **DB is 40%** of FY19 construction spend | ↑ | ▪ **DB likely to increase**<br>▪ **Other innovative contract-ing likely to increase** |
| Shift to focus on operations | ▪ FY09: **Operations expense 43%** as much as construction expense | ↑ | ▪ FY19: **Operations expense 60%** as much as construction expense | ↑ | ▪ Operations expense expected to **continue to rise** as share of portfolio |
| Greater decentralization | ▪ FY15, **5% of construction spend**, 47% of projects are division led | ↑ | ▪ FY19, **9% of construction spend**, 52% of projects are division led | ↑ | ▪ **Divisions increase** share in construction, maintain share in operations |
| Declining internal workforce | ▪ **~15K employees (1996)** | ↓ | ▪ **~10K employees** | ↓ | ▪ **Potentially fewer employees**, greater outsourcing |

1 May be influenced by cost inflation factor as well

# 1 Different legislative actions have impacted NCDOT balance




**Creates Highway Use Tax** for highway capital projects

Equity more of a priority

Intended to **reduce high cash balances**

Combined two funds for cash purposes, permitted used for maint-enance

Intended to **reduce cash balances further**

Highway fund authorized to cover Trust Fund expenses

Adopted data-driven project selection

85% of projects different than prior STIP

**Cash balances increase**

**Set cash balance target to 15 to 20% of spend**

Moved floor from 5.0% to 7.5% of revenue

**Cash balances peaked at $2.1B**

Forecasts seemed accurate

Hurricane damage begins

Set **ceiling of $750M in cash to allow bond sales**; later changed to $1B

**Created Disaster Relief Fund**

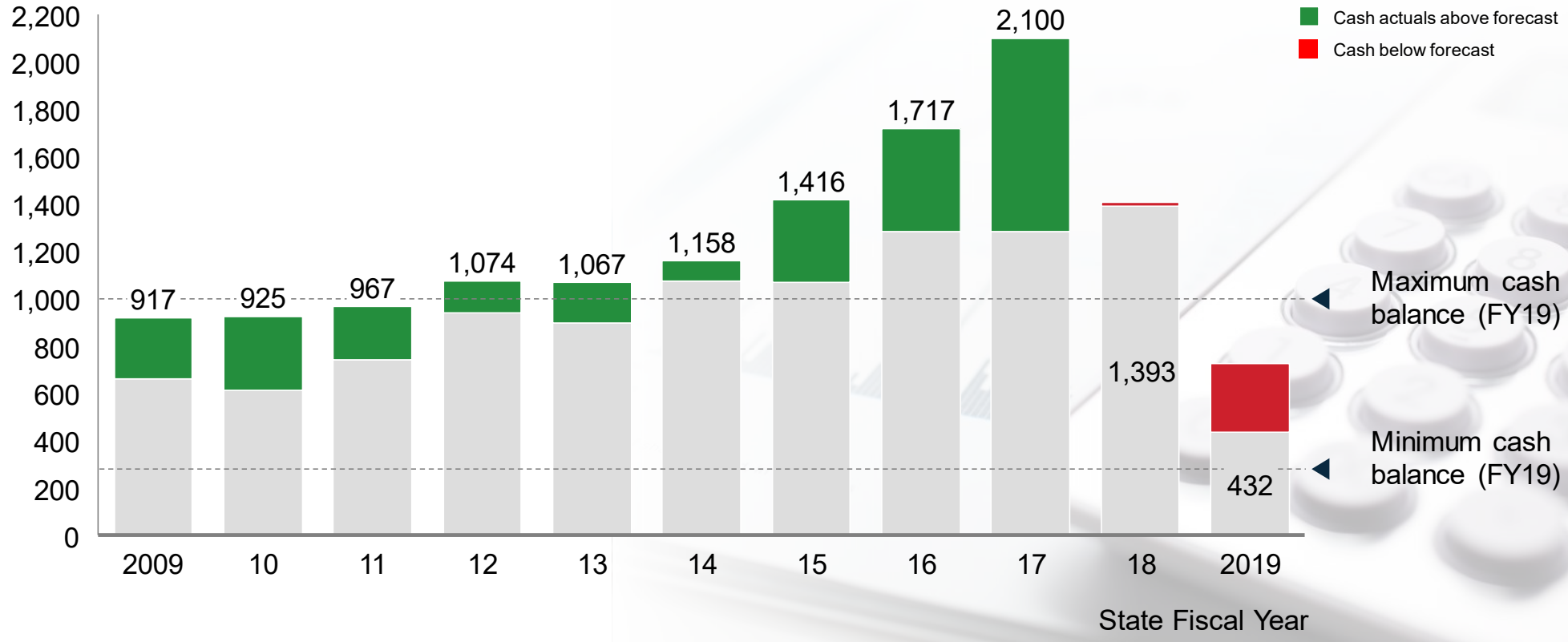
Loan of $90M

Reimbursement of storm expenditures and $58M in accelerated repayments to NCDOT

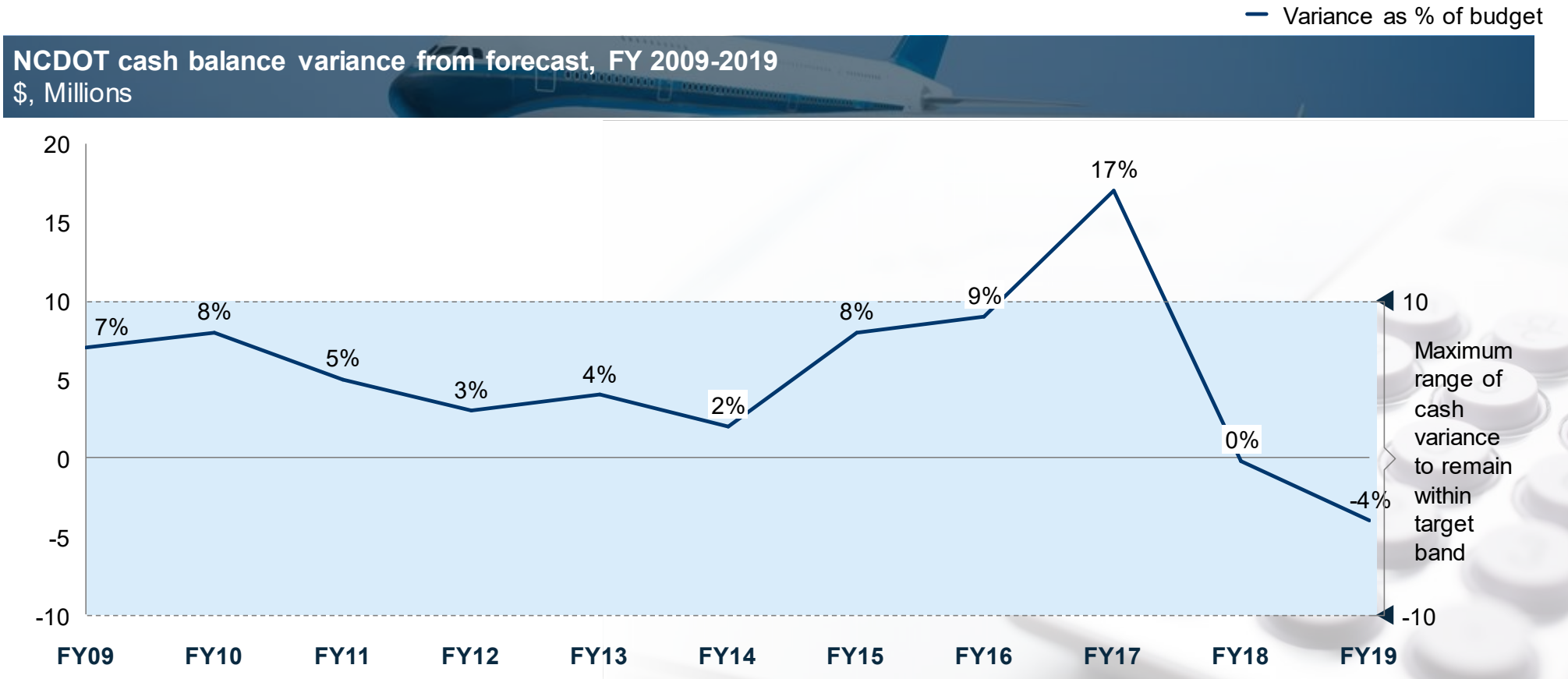
SOURCE: NCDOT

# 1 NCDOT cash balance actuals and forecasts (2009-2019)

**NCDOT cash balance actuals and forecasts**
$, Millions



# 1 FY19 negative cash variance was a shift versus a pattern of increasing cash variances

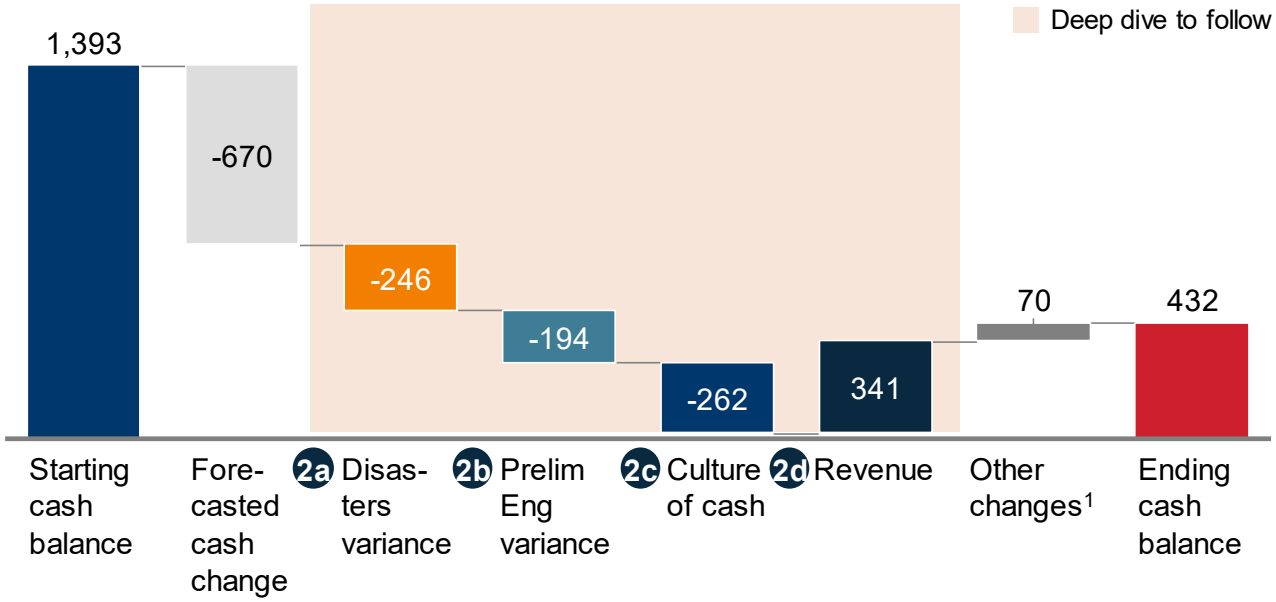



1 Includes Other Modes and Other Expenditures categories of cash model. Other expenditures includes Admin, State agency transfers, General Fund transfers, State aid to municipalities, debt service excluding GARVEE & Build NC, Other programs; Represents a precision that NCDOT has not often achieved (exceed or nearly exceed 4 of last 5 years)

SOURCE: NCDOT cash models 2014-19 as of 30 Apr 2019, "Qtr compare to baseline" tabs

# 2 Disasters, preliminary engineering and a weak 'culture of cash' contributed to nearly 70% of the FY19 variance

**NCDOT cash balance variance from forecast, FY 2019**
$, Millions




**Share of absolute variance of FY19**

| 22% | 17% | 24% | 31% | 6% |
|---|---|---|---|---|

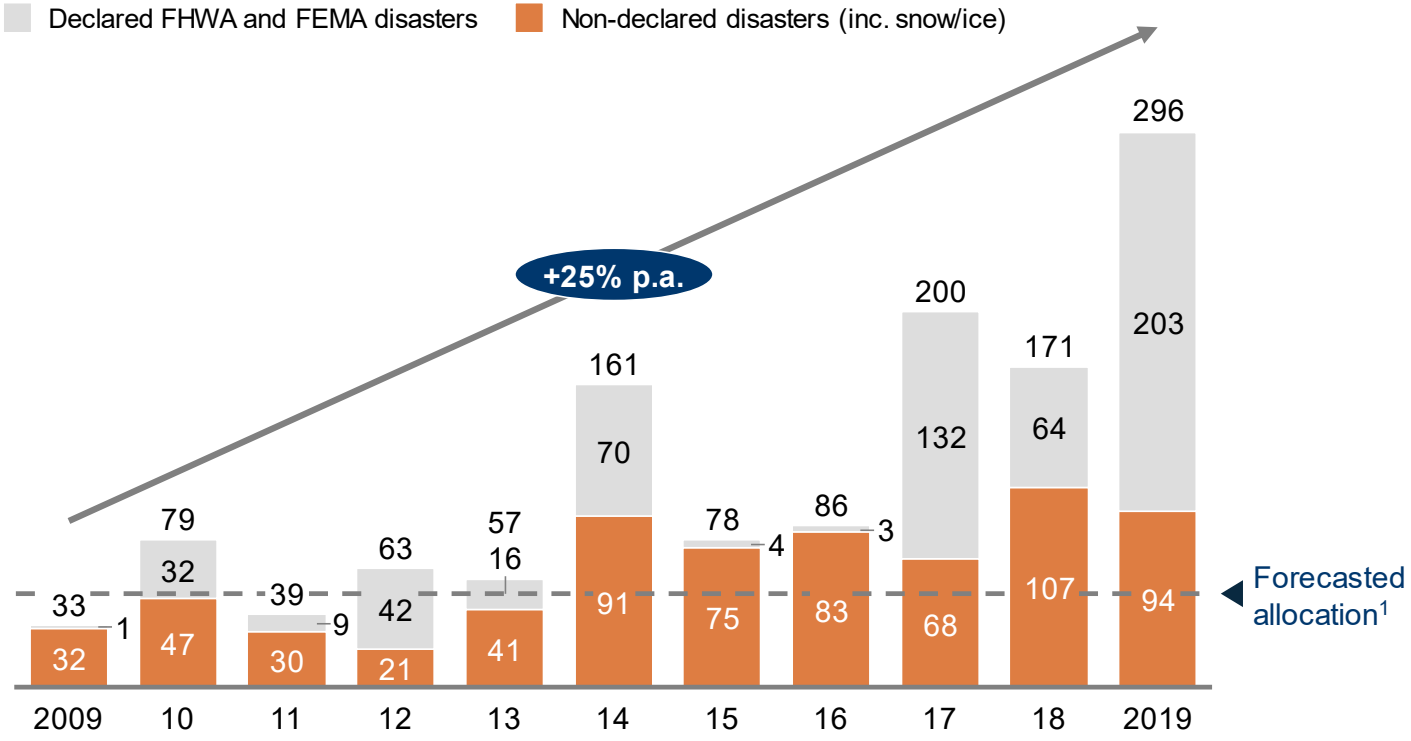
- **Nearly 70% of FY19 variance** (on an absolute basis) was due to either **disasters (22%), preliminary engineering (17%), or broader performance / governance challenges** with contractors and Divisions **(24%)**
- **Revenue has historically been relatively well-forecasted,** and experienced a positive 6% variance in FY19
- **Other expenses and working capital changes are small contributors to** absolute variance

1 Includes Working capital changes as well as other expenses including "Other modes" category of cash model as well as "Other expenditures" category (includes state agency transfers

SOURCE: NCDOT cash model FY19, "Qtr compare to baseline" tab, Historical Data_Emergency Expenditures & Reimbursement as of 5 August 2019

# 2a Disaster spend has consistently exceeded forecast since 2013

**NCDOT spend on declared and non-declared disasters, including snow and ice, FY09-19[2]**
($, Millions)



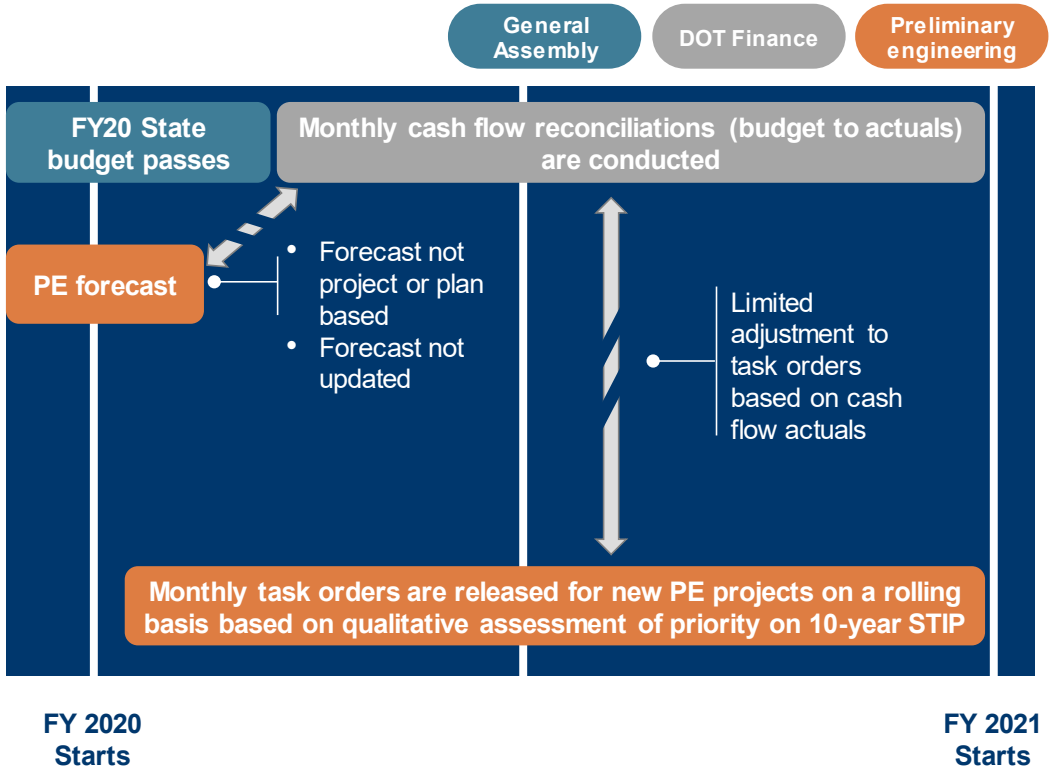

- NCDOT **disaster expense has grown at a CAGR of 25% per year since 2009** but forecasted allocations have remained constant
- While disaster spend was close to allocations from 2009-13; **large increases experienced in 2014-19**, from both declared and non-declared disasters

1 Operations budgets $10M annually for FEMA disasters and an additional few million dollars (exact amount changes annually) for enterprise non-declared disasters excluding snow and ice. This amount assumed to be $5M annually here, plus $35M budgeted for snow/ice, or $50M in total
2 Includes FHWA construction spend and non-emergency declared disasters

SOURCE: Historical Data Emergency Expenditures & Reimbursement as of 5 August 2019, NCDOT cash models 2009-2019, "Qtr compare to baseline" tabs

# 2b Preliminary engineering has not used robust forecasting process, nor historically prioritized its contribution to cash variance, instead focusing on building a pipeline of projects

## Stylized preliminary engineering process flow



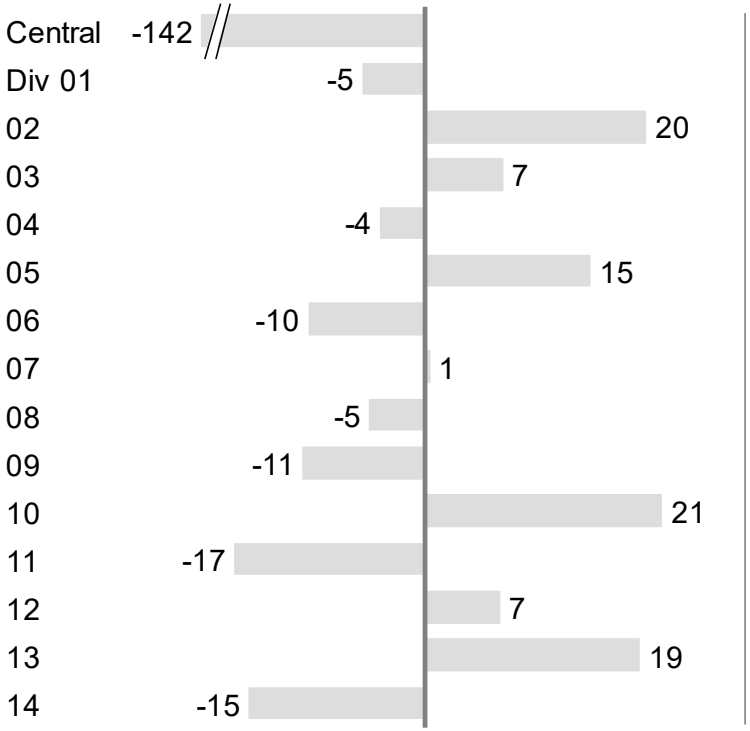

## Key forecasting challenges

- **Preliminary engineering forecasting is based on prior-year budget,** rather than a project demand-based model
- PE efforts in recent years **intentionally overspent budget** to build pipeline of projects
- **Mid-year PE spending adjustments are hindered** by > 1-year task orders

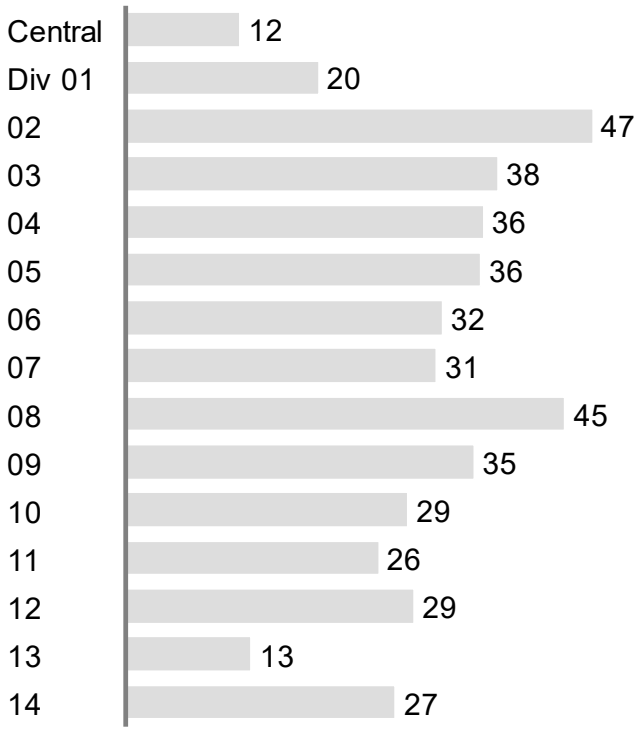
SOURCE: Interviews with NCDOT Preliminary Engineering staff leadership

# 2c Divisions have historically missed cash forecast; in FY19, all divisions overspent their allocation, amplifying the total operations spend variance

**NCDOT operations spend variance[1] by division, FY15-17 cumulative** ($, Millions)




**NCDOT operations spend variance[1] from allocation[2] by division, FY19** ($, Millions)




- Before pressure to reduce cash below the cash limit, divisions varied widely on spending variance (both positive and negative variances)
- After recent pressure to reduce cash balances, divisions uniformly overspent

1 Actual minus allocation. Actual spend is derived from Ops trackers and therefore excludes local, public/private match, damages and fees and will differ slightly from cash model actuals
2 Allocations refers to the appropriated budget for the year, plus any mid-year supplemental funding that is allocated

SOURCE: NCDOT operations allocations and actuals by division by year, FY19; Dashboard modernization overview August 2019

# 2c Divisions have historically prioritized project delivery, and other goals, over meeting cash forecast targets

**Adherence to cash forecast has not always been a top priority across NCDOT**

- Every division overspent FY19 appropriations
- Current performance management practices do not support adherence to cash forecast e.g.,
  - Of 47 performance metrics, only 3 address finances
  - Divisional leadership not a part of monthly finance meetings
  - Financial leadership not a part of monthly highway division staff meetings where project delivery decisions are made

**NCDOT primary metrics (subset)**

1. Final Planning Document Success
2. ROW Plans Complete
3. Let Success (…)
13. Bike & Ped Crash Count (under dvmt)
14. Revenue Amount
15. Expenditure Amount
16. Cash Balance
17. MBE/WBE Utilization
18. Structurally Deficient Bridges
47. Employee Unplanned Absence Rate

**From interviews with division leaders…**

*"We generally deal with what is allocated, not cash."*

*"In the past 2 years we had to double up on resurfacing - were behind…so this past year had to spend what we got and also spend the next year's money"*

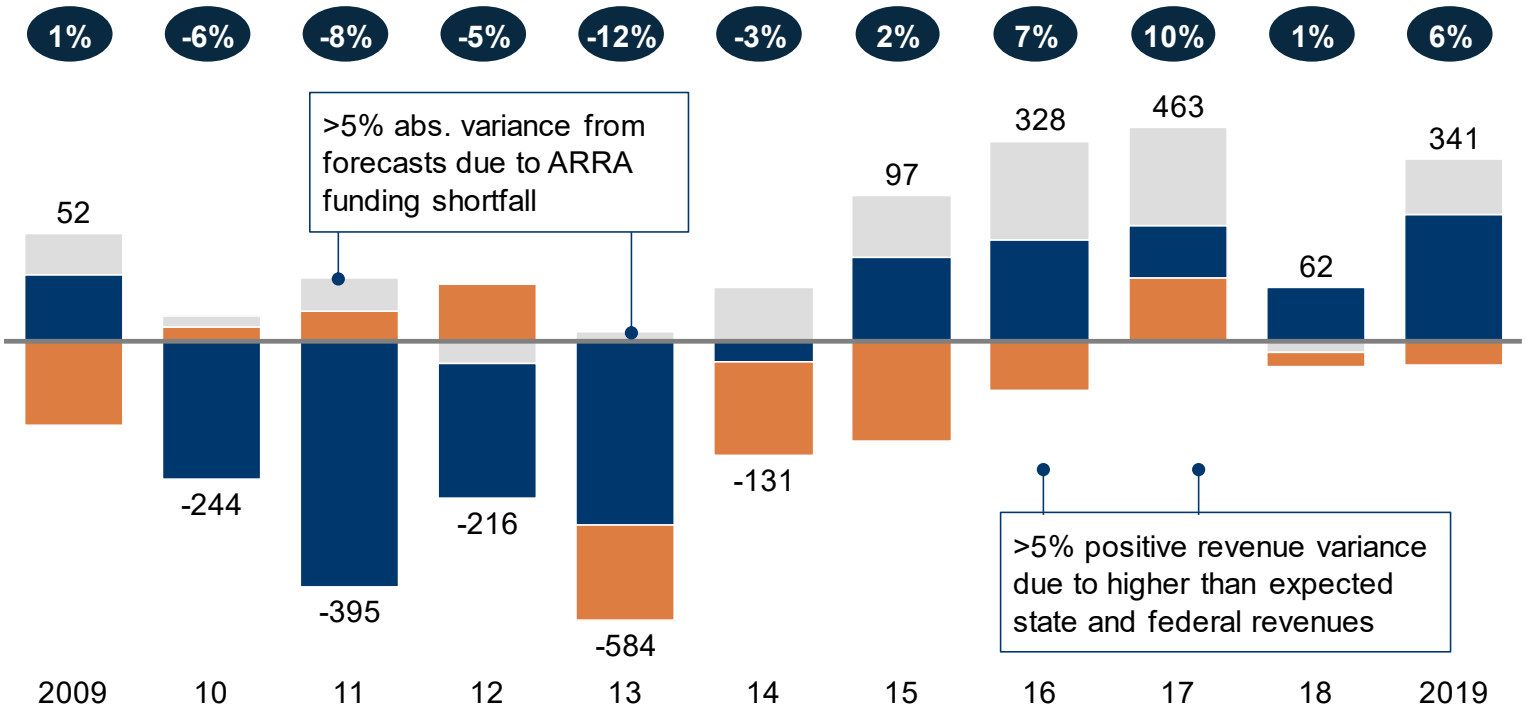
*"Even though we received $56M in contracts, we're letting $100M because we were spending previous year's money. I'm not sure if this was getting translated up to cash model in aggregate."*

SOURCE: NCDOT operations allocations and actuals by division by year, FY19; Dashboard modernization overview June 2019

# 2d Revenue forecasting variance is typically less than 7%, and often much smaller

State revenues [1] | Federal revenues and grants[2] | Other revenues and bonds | X% Percent over/under forecast

**NCDOT revenue variance, actual minus forecasts**
$, Millions




- While there have been **historical variances in revenue projections**, overall revenues have been within 7% of forecasts in most years
- **Variances largely been driven** by federal funding (e.g. ARRA)
- **Trends in the future of mobility** may increase variance going forward; **dependence on motor fuel taxes likely makes NCDOT more** vulnerable to consistency in revenues than peers states

1 Includes all state revenues from motor fuel tax, highway use tax, and DMV fees
2 Includes Turnpike, InfraGrant, ARRA

SOURCE: Certified Budget Revenues, NCDOT Cash Flow Model

# 3 NCDOT challenges will likely increase in the future given more complex work and leaner staff

| Key trends | Past NCDOT | | NCDOT today | | NCDOT 2030+ |
|---|---|---|---|---|---|
| Larger projects[1] | ▪ FY07 **Projects >$10M: 56%** of let spend | ↑ | ▪ FY19 **Projects >$10M: 87%** of let spend | ↑ | ▪ FY23-25: **Projects >$10M: >90%+** of let spend |
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# 3 Four sets of initiatives will mitigate variances going forward

PRELIMINARY

| Focus area | Initiative |
|---|---|
| Improve annual cash forecasting | Improve **financial planning coordination across the organization** (e.g. between central DOT and divisions/modes) and **apply increasing rigor into forecasting** for areas requiring more precision (e.g. snow/ice, disaster, preliminary engineering) |
| Contracting | Survey contracting landscape and investigate potential structures, to **develop new contracting model that increases agility** while meeting NCDOT's other objectives (e.g., value for money) |
| Organizational performance and governance | **Set cash KPIs**, and **cascade these throughout NCDOT**; then set governance and processes for **responding to cash overages**, as well as **consequences for areas that overspend** |
| Build robust data architecture and embed digital capabilities | Create a **single source of truth** around data, and **improve data governance**, to enable **real-time view of cash**, and the application of **predictive analytics** |

**Cross-cutting themes:**

- **Improve communication** (e.g. standard cash definition, cascading comms throughout organization)
- **Increase coordination** (e.g. between divisions and central, across DOT decision-making, standardized data)
- **Embed prediction** (e.g. embed predictive abilities, make decisions in advance, advanced analytics)

SOURCE: Best practices, NCDOT leadership workshop, team analysis

# 4 There are a number of changes by outside parties that could help NCDOT adapt to this new environment

PRELIMINARY

## Levers

Additional detail follows

Changes in legislative rules that could help alleviate cash reserve pressures could include, but are not limited to:

- **Aligning the current cash ratio with peer states by adjusting reserve requirements**
- Consolidating funding sources into one fund to facilitate cash response agility
- Establishing a working capital loan facility to mitigate unforeseen short-term cash crunches
- Excluding disaster spending from cash balance requirements, e.g., ensuring that disaster spending, including that covered by Disaster Relief Cash Flow Loan Fund, does not count against legislative mandated cash balance, or borrow out of general fund for disasters

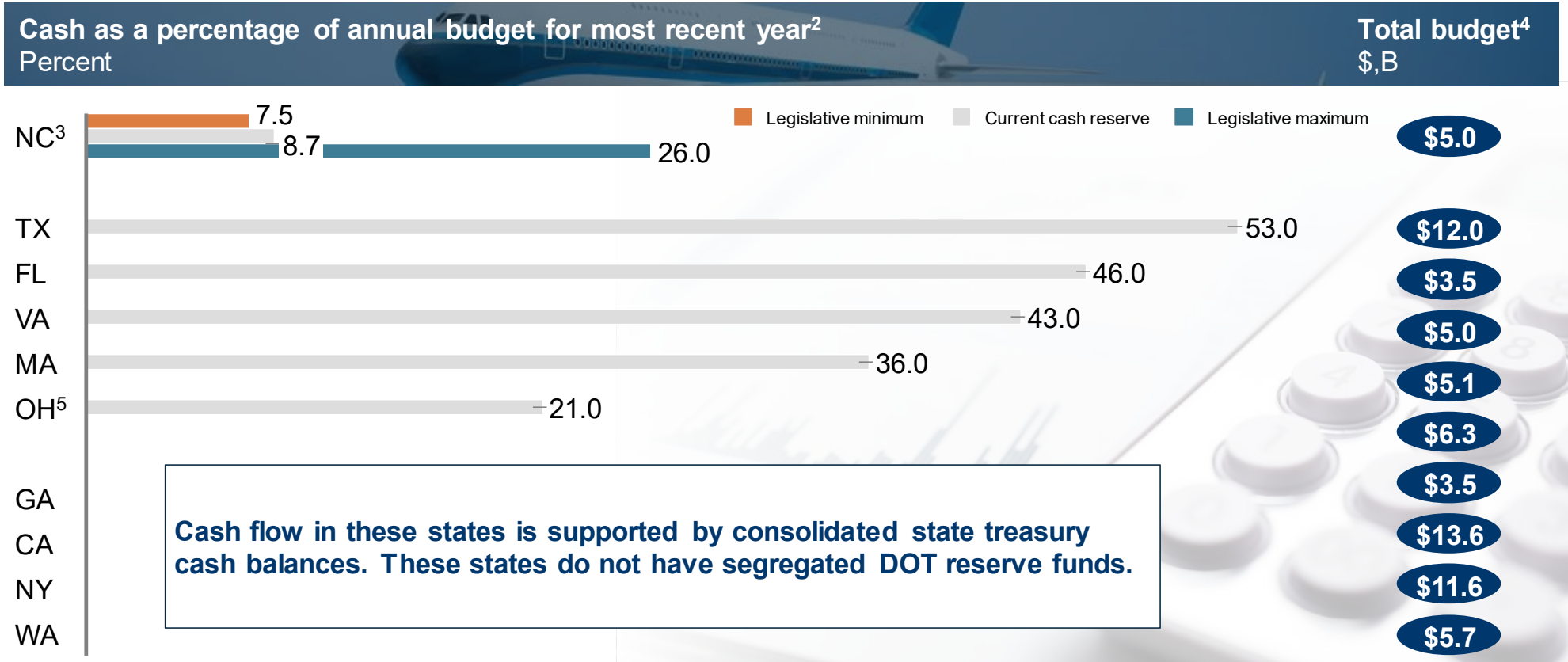
### Considerations

- Working capital loans are not frequently used in peers states. However, short-term loans or short-term contract debt are more frequently used to buffer cash flow variance in design-build projects

### Impact

- Shifts demands on cash flow from management practices and operations to financing mechanisms

# 4 NCDOT cash limit requirements are narrower than peer states[1] which will make meeting cash targets more difficult going forward



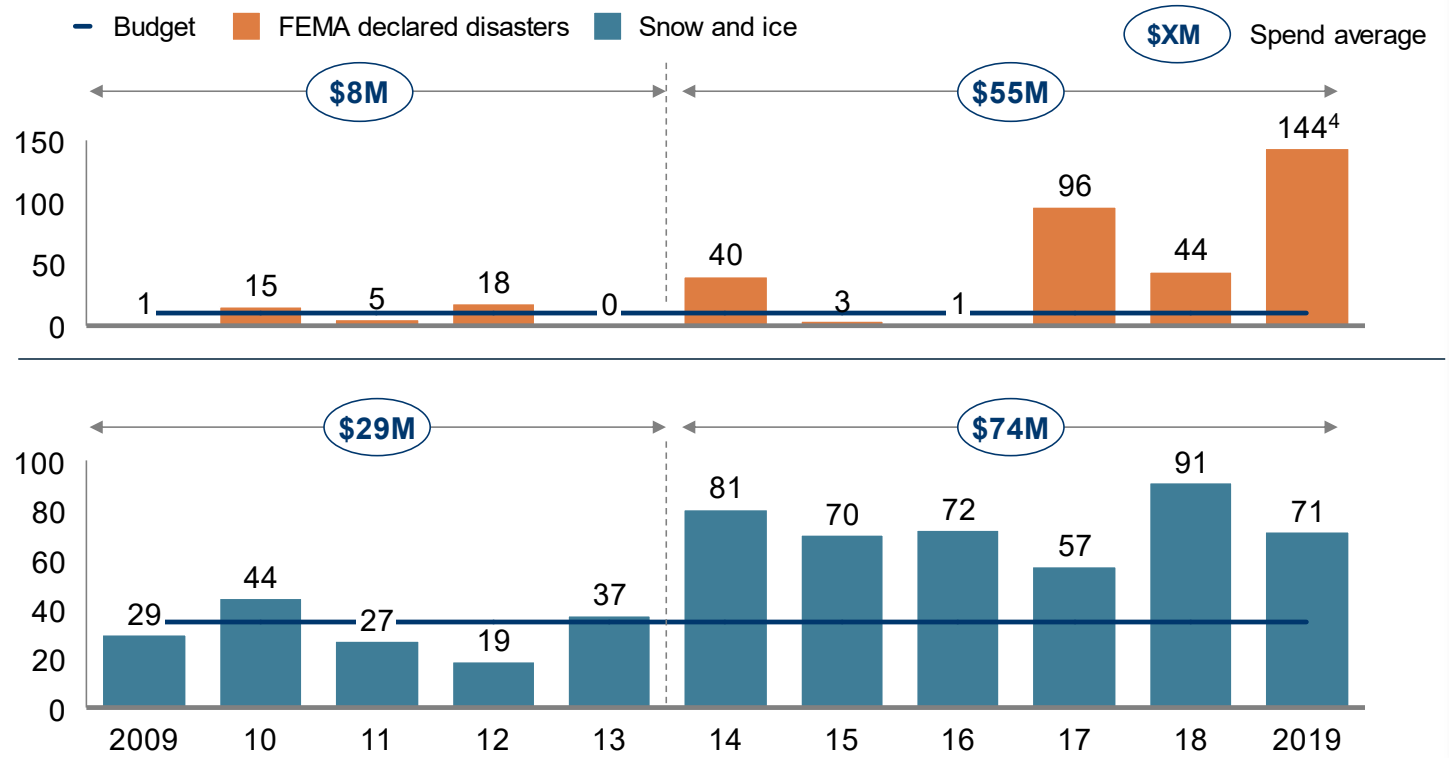

1 Peer states are other large or comparable states based on drivers of transportation needs (e.g., size, population growth, GDP growth); 2 Percentage is of state DOT appropriations; 3 NC's appropriated revenues (net federal receipts) are the basis for lower limit. The upper limit is $1 billion total cash balance--the equivalent of ~26% of appropriated state revenue not including federal revenues; 4 State DOT scopes vary (whether they include multi-modal and local roads); financial reporting approach varies by state, fund source, and accounting and reporting methodology (variations include restricted/unrestricted cash pooling and reporting of federal receipts); 5 OH: Significant tax increase under consideration to cover transportation funding liabilities

SOURCE: State DOT Annual Financial Statements and State Annual CAFR (NC is from 2019; TX, VA, OH, MA, GA, CA, NY are from 2018; FL, WA is from 2017)

# Appendix

# 2a Beginning in 2014, spend associated with disasters exceeded budgeted amounts

**NCDOT spend on declared disasters and snow and ice, FY09-19[1,2]**
($, Millions)




- NCDOT disaster **spend has grown significantly since 2009**, particularly for FEMA declared disasters and snow and ice
- **Both snow/ice and hurricanes drove large increases in 2014-2019**, relative to 2009-2013
- However, **forecasted amounts for disaster spend has remained constant** despite increases in spend
- **Snow/ice spend variance, as well $5M in undeclared disaster spend, did not contribute to variance**, since other spend was lowered; **$54M in FHWA disaster spend was in construction** and did not contribute to operations variance

1 FHWA disaster expenses not included because come out of the construction budget
2 operations budgets $10M annually for FEMA disasters and an additional few million dollars (exact amount changes annually) for enterprise non-declared disasters excluding snow and ice. This amount assumed to be $5M annually here.
3 Includes FHWA declared disaster and non-emergency disaster (excluding snow and ice) 4 The $140M is from the cash model; the $136M shown here is from the disaster spending tracker

SOURCE: Historical Data_Emergency Expenditures & Reimbursement, NCDOT cash models 2009-2019, "Qtr compare to baseline" tabs

# 2d Trends in the future of mobility can put revenue projections at risk

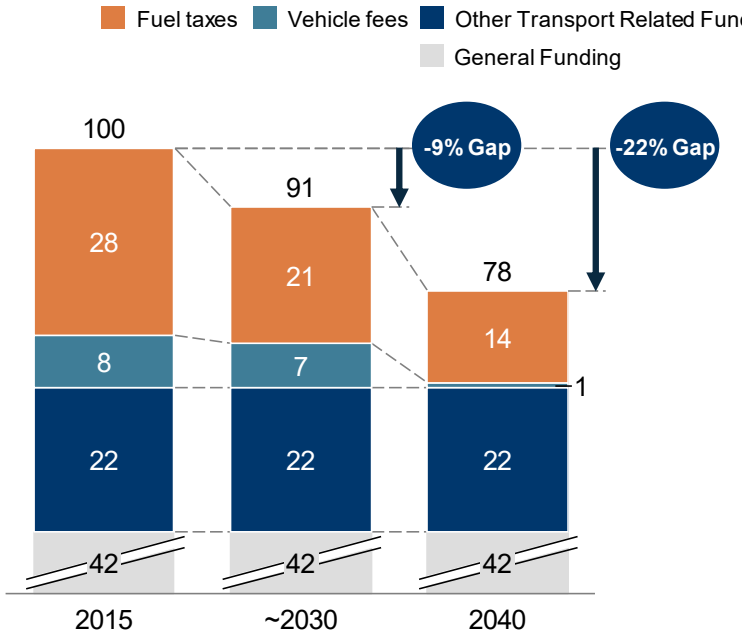
General Funding[2] | Other Transport-Related Funding[3] | Vehicle Fees[4] | Fuel Taxes[5]

**Changes in mobility will reduce funding from fuel taxes and vehicle fees**

**Given NC's dependence on vehicle-related revenues, future funds at risk and must tackle issue going forward**

**Funding for State and Local road spending across U.S., historical (2015) mixed traffic (~2030) fully autonomous world (~2040)**

Portion of total road funding covered (%)

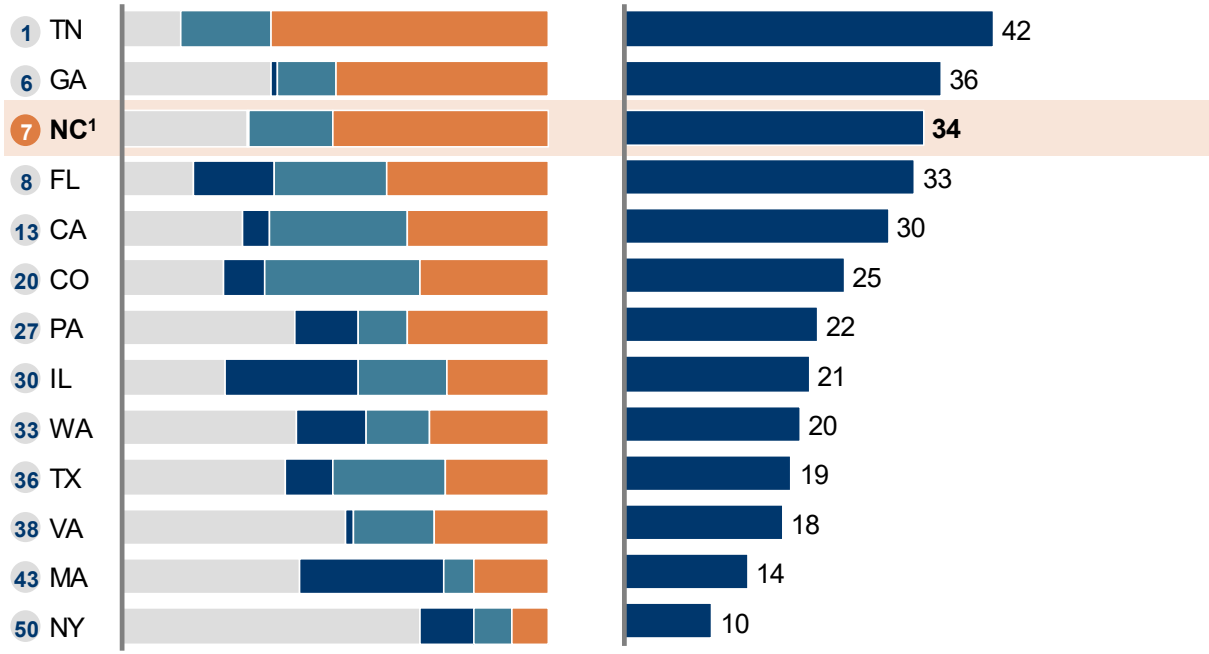



**Revenue composition of road funding in 2015 by state**

Portion of total road funding covered (%)

**Gap in 2015-2040**

x National ranking of highest funding gap




1 Timing, different data sources account for a small mismatch; general funds include state/local;
2 General funding includes parking fees, investments, bonds, general funding, and other non-fuel and non-vehicle taxes at state/local/federal levels; 3 Includes tolls and property taxes;
4 Includes all motor vehicle taxes and fees; 5 Includes local, state, and federal fuel and gas taxes

SOURCE: Federal Highway Authority Revenue Tables HF1, LDF, LGF21 (2015)

# 3a Forecasting

PRELIMINARY

| Focus area | Where we want to go | Root cause addressed |
|---|---|---|
| Improve coordination between division and central | ▪ **Mandate spend operating plans** for divisions and modes<br>▪ Create **communication mechanism between divisions and central** for real time data flow (e.g. dashboard)<br>▪ **Established structured monthly meetings** between central and divisions/modes to coordinate and align on progress | ▪ Lack of prioritization and project controls<br>▪ Agility of operating model |
| Enhance learning loop of SAS | ▪ **Develop formal real-time mechanism to communicate project changes** to SAS model<br>▪ **Incorporate tools to flag early warning signs** for projects<br>▪ **Develop metrics to assess accuracy of model** | ▪ Agility of operating model |
| Improve snow / ice and disaster forecasting | ▪ **Develop budgetary plan for snow/ice and disaster spend** in line with historical data | ▪ Agility of operating model |
| Add rigor to PE forecasting | ▪ **Plan yearly PE portfolio** in advance<br>▪ **Conduct project level forecasts** using historical curves and build bottom-up forecasts<br>▪ **Improve contractor estimates** by developing internal benchmark estimates | ▪ Lack of prioritization and project controls<br>▪ Agility of operating model |

SOURCE: Best practices, NCDOT leadership workshop, team analysis

# 3b Contracting

PRELIMINARY

| Initiative | Where we want to go | Root cause addressed |
|---|---|---|
| Investigate contracting landscape and potential structures | ▪ **Conduct diagnostic on contracting** by examining pain points of current contracting, vendor and stakeholder landscape, and future state objectives | ▪ Agility of operating model |
| Develop processes and operating model to implement new contract structure | ▪ **Determine best-fit contract structures for objectives and develop implementation road map**, addressing critical enablers, procurement operating model, processes, and vendor management process needed to achieve objectives | ▪ Agility of operating model |

SOURCE: Best practices, NCDOT leadership workshop, team analysis

# 3c Organizational performance and governance

PRELIMINARY

| Initiative | Where we want to go | Root cause addressed |
|---|---|---|
| **Establish and prioritize cash variance-based KPIs** | ▪ Develop **cash-related KPIs**<br>▪ **Cascade and embed KPIs** into all aspects of organization<br>▪ **Develop incentives** to follow KPIs across | ▪ Lack of prioritization and project controls |
| **Cascade cash reporting & decisions throughout organization** | ▪ Develop and communicate **consistent definition for cash**<br>▪ **Embed cash reporting, review and decisions** across NCDOT<br>▪ **Establish a council** where cash decisions are made in balance with other strategic priorities<br>▪ **Establish an SOP for cash levers** that will be methodically evaluated<br>▪ Use **consistent views** of the data | ▪ Lack of prioritization and project controls |
| **Establish governance for timely cash decisions across NCDOT** | ▪ Shift to **shorter time periods** for cash targets (e.g. quarter vs. annual)<br>▪ Adjust division spend plans every **3-6 months**<br>▪ Embed **early warning signal tools** to predict potential shortfalls<br>▪ Require each division to **create contingency**<br>– Integrate broader stakeholders into cash flow decisions<br>– Ensure overruns have offsetting decisions in cash elsewhere | ▪ Lack of prioritization and project controls<br>▪ Agility of operating model |
| **Establish consequences for performance** | ▪ NCDOT **executive leadership intervenes** regularly<br>▪ Add **fiscal year budget targets and cash KPIs** to performance evaluations<br>▪ **Heighten executive scrutiny** of business plans for poor performers<br>▪ **Disallow 'borrowing'** from future year budgets | ▪ Lack of prioritization and project controls |

SOURCE: Best practices, NCDOT leadership workshop, team analysis

# 3d Data, digital, tools to enable agility and controls

PRELIMINARY

| Initiative | Where we want to go | Root cause addressed |
|---|---|---|
| Develop diagnostic baseline on existing data | ▪ **Develop data lake** to determine baseline of existing data and analytics capabilities | ▪ Agility of operating model |
| Create single source of truth | ▪ **Build a roadmap to a single source of truth**<br>▪ **Coordinate with the Department of IT** on digital roadmap | ▪ Agility of operating model |
| Improve data governance | ▪ **Assign clear owners to individual data elements**<br>▪ **Increase coordination between NCDOT IT and Finance**<br>▪ **Establish data governance structure based on business needs** rather than reporting requirements<br>▪ **Create procedures for data use and changes** | ▪ Agility of operating model |
| Enable real-time data | ▪ **Reduce lag times** between SAP and HI-CAMS<br>▪ **Create a clear and consistent process** on pulling data for reports<br>▪ Incorporate **cash forecast data into dashboard** to assess real time cash position across organization | ▪ Lack of prioritization and project controls<br>▪ Agility of operating model |
| Embed predictive analytics | ▪ Automate analysis of data and processes to **create 'red flags'** on key issues (e.g. contractor performance predictions)<br>▪ **Advanced analytics for asset disposition and other business needs** (e.g., tool to determine utility and value) | ▪ Lack of prioritization and project controls<br>▪ Agility of operating model |

SOURCE: Best practices, NCDOT leadership workshop, team analysis