



**NORTH CAROLINA**  
Department of Transportation

# Digital Delivery at NCDOT

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Technical Services, Deputy Director


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Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina



**DIGITAL  
DELIVERY**

# WORDS MATTER!




**Digital Delivery** is the use and transfer of digital data between preconstruction, construction, asset management and external consumers.

Purpose: To *deliver data* in a directly consumable format to maximize the benefits of the information for decision making and program delivery.

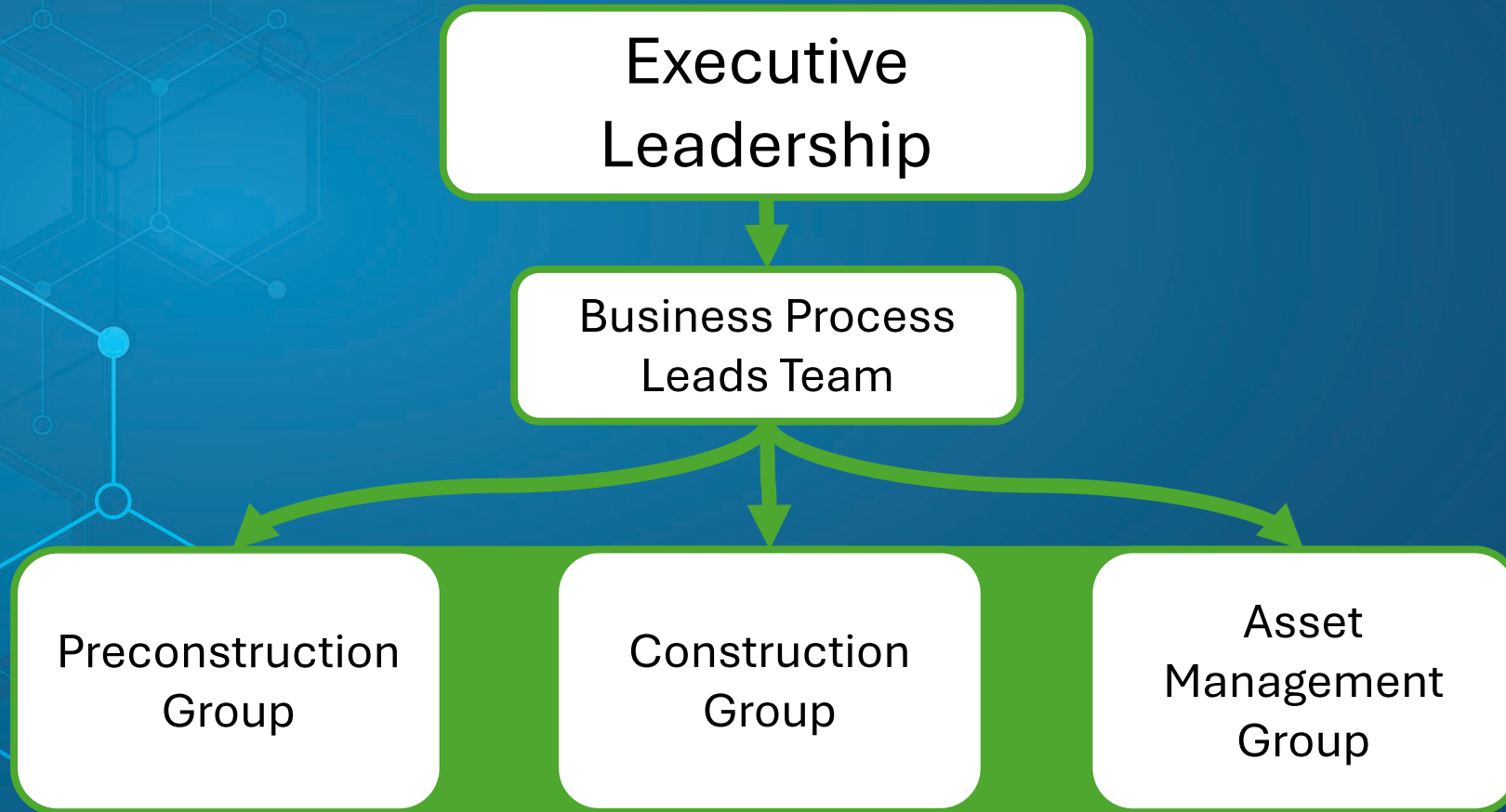
- Current NCDOT Definition

**NCDOT DD IS FOCUSED ON CADD/DESIGN**

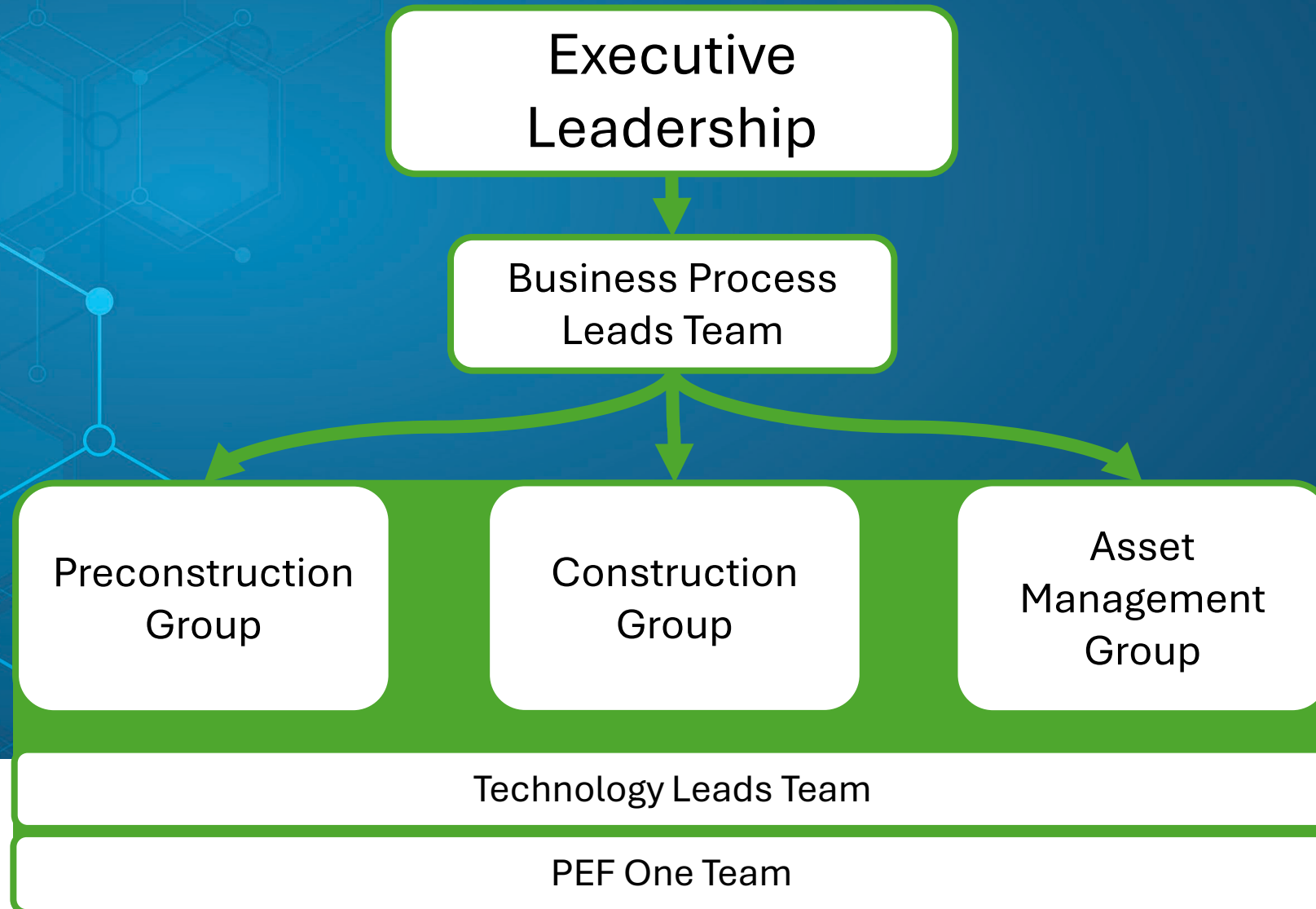
# Digital Delivery Goals

- 
- Short-term: Continue development and implementation of training and piloting efforts to support digital delivery.
  - Intermediate: Implement digital delivery of conventional plans with a 3D model.
  - Long-term: Define and implement fully integrated digital delivery

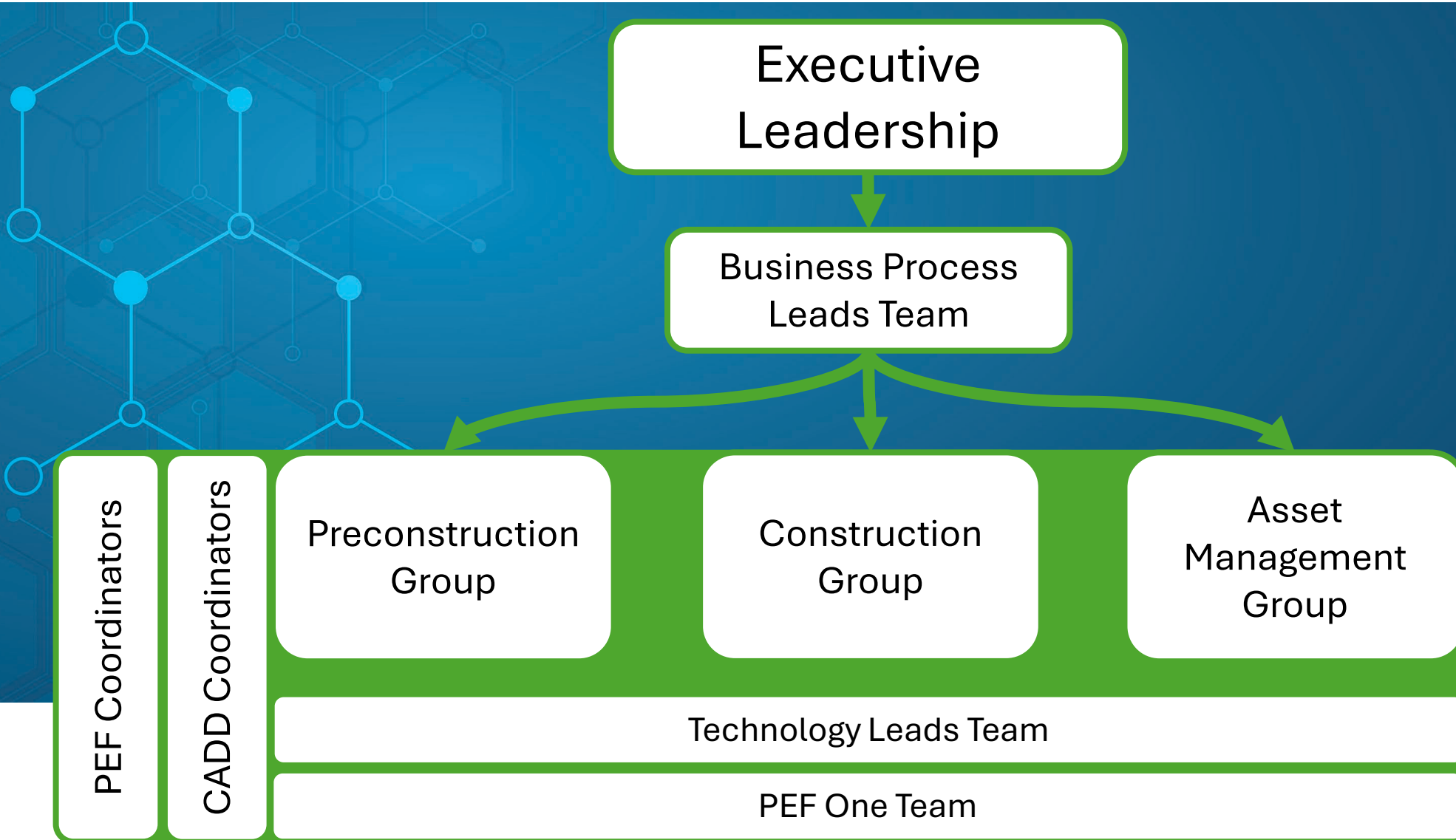
# Digital Delivery Organization



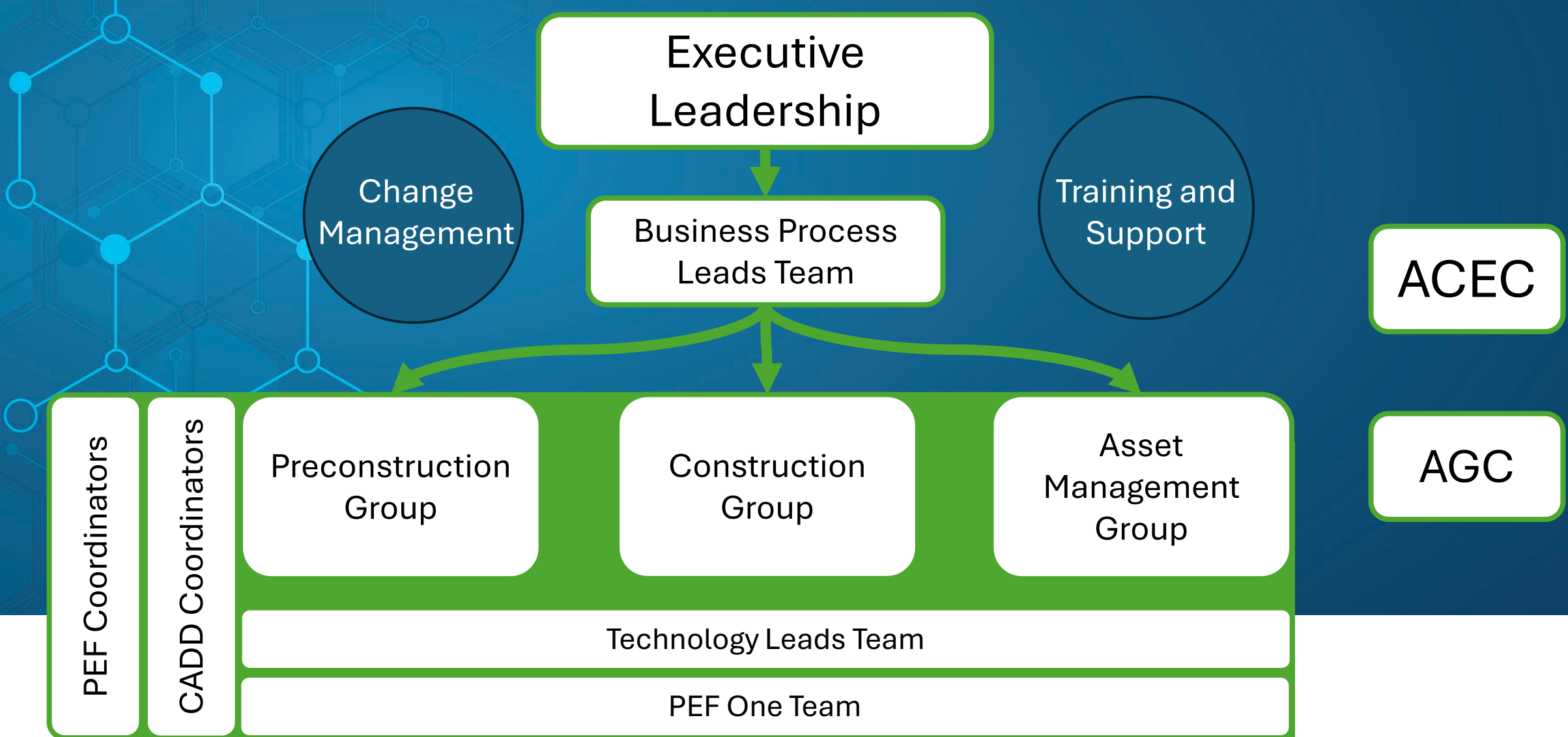
# Digital Delivery Organization



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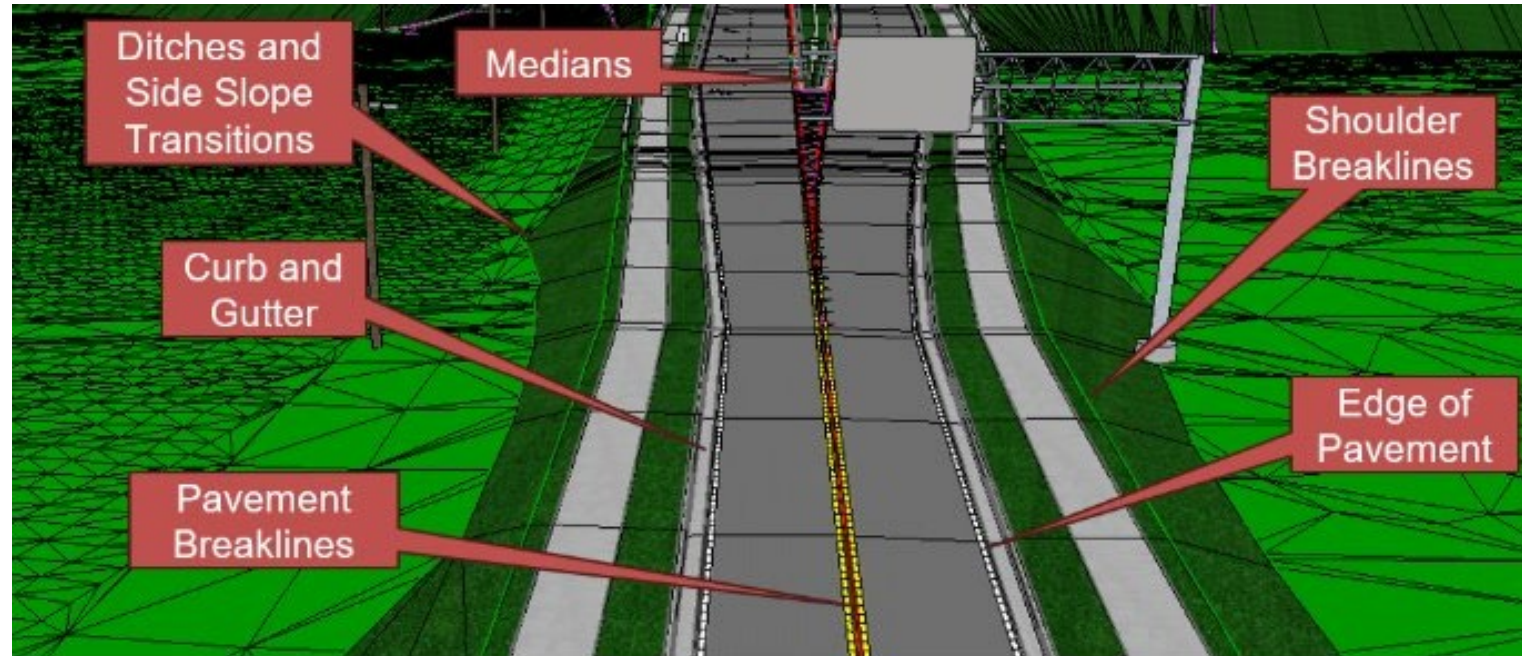


# Digital Delivery in Preconstruction

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# 2025 Goal Number 1

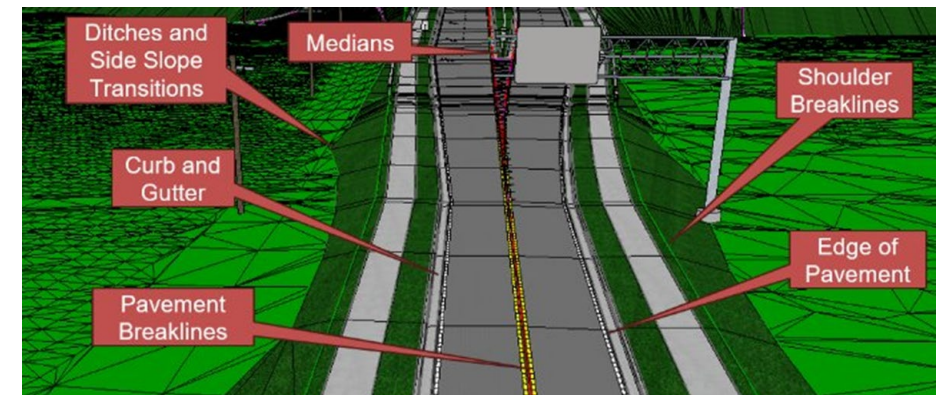
Define the model (components, format(s), Level of Effort (LOE)/Level of Detail (LOD)) with focus on integration.



# 2026 Goal Number 1

**Define interdisciplinary design workflows to achieve the desired Level of Development with focus on integration**

*When finalizing the Level of Development in Winter 2025, there were several action items identified related to areas where design guidance was lacking. This goal will focus on working with each Unit to develop interdisciplinary guidance on what is expected during preconstruction design phases. It will also identify where this guidance should live and be published. The primary focus will remain on delivering 2D and 3D designs that provide meaningful, value-added outcomes in preconstruction and construction.*



## 2025 Goal Number 2

Develop Process/Workflow Mapping with focus on integration. This goal includes mapping existing software and identifying future software needs which will lead to expansion of naming and version guidance.



# 2026 Goal Number 2

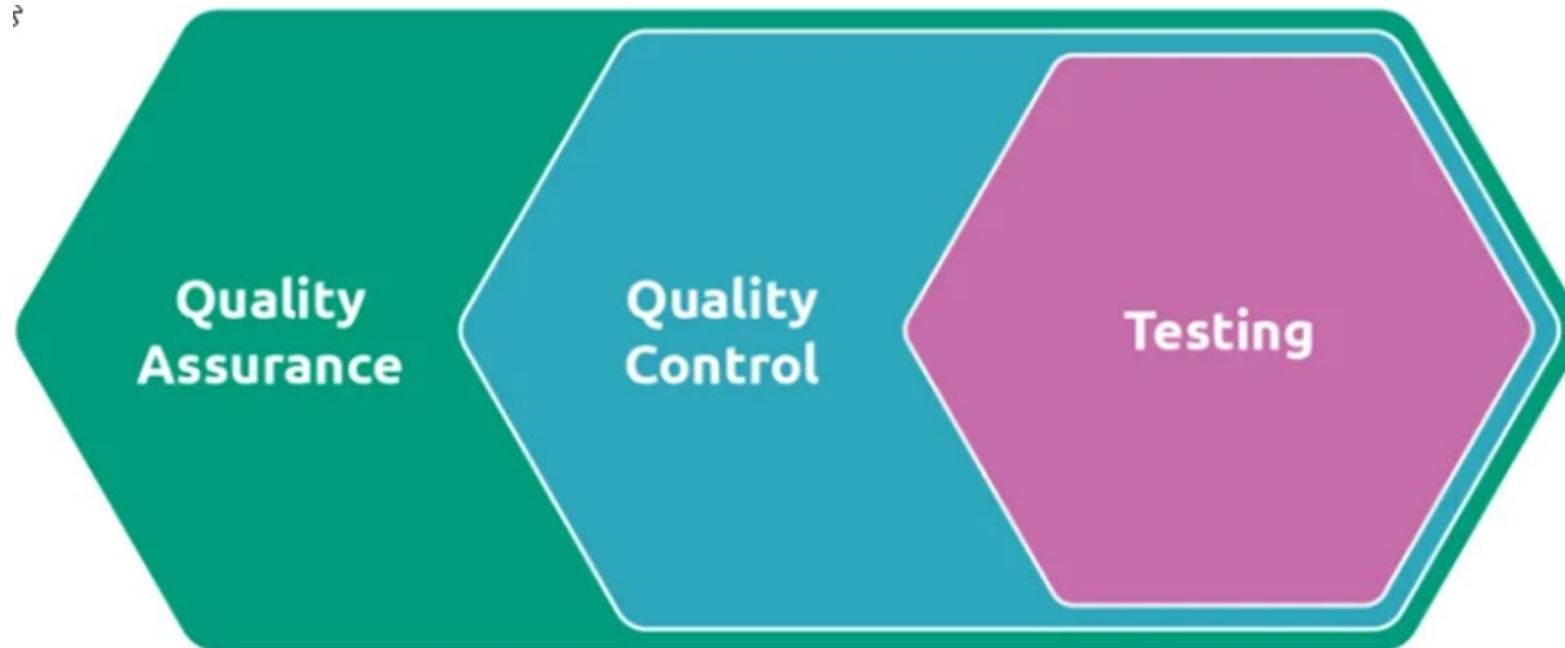
## **Finalize Process/Workflow Mapping and develop File Naming and Versioning Guidance for digital files with focus on integration**

*With software needs identified, the next step is to finalize a primary list of required applications and share it internally. The process and workflow mapping already completed by the Technology Lead Team should be used to inform high level planning efforts and identify pain points in current digital processes. The file naming and versioning best practices will be combined from each unit and refined into formal guidance. This will consist of PDN updates to guide project managers. The focus should remain on ensuring the Department realizes appropriate benefits from the model while improving efficiency.*



# 2025 Goal Number 3

Update of QA/QC and plan checking guidance/practices pertaining to the model with focus on integration. This goal will include Development of QA/QC processes for the model.



# 2026 Goal Number 3

## Update of QA/QC review practices pertaining to pdfs and electronic files with focus on integration

*Existing plan checking guidance documents and QA/QC checklists will be expanded or revised to reflect new requirements associated with delivering electronic files with pdf plans. In addition to revising current guidance, a new QA/QC process and associated documentation will need to be developed to address reviewing the model at various stages of design. This effort will need to include considerations for the roles of the technical experts, project managers, plan checkers and construction staff. Lastly, pdf review processes utilizing Bluebeam will be developed for use by all Units.*



# 2025 Goal Number 4

Identification/Delivery of Pilot Projects providing AMG for information only in 2025 with focus on integration. Determine how we produce, utilize and get feedback from Contractors by adding verbiage in contract.



# 2026 Goal Number 4

**Identification and Coordination of Pilot Projects to produce Construction Ready Electronic Files (CREFs) for information only in 2026 with focus on integration Define and refine how we produce, utilize and get feedback from Contractors (verbiage in contract). Incorporate the feedback into development of guidance and training**

*This goal focuses on getting CREFs produced and provided to the Contractor with contractual language to ensure they consider, review, use (with limitations) and provide feedback on the files provided by the Department. This goal is intended to build trust with the contracting industry and ensure that what we are providing adds project value. The identification of pilot projects focuses on projects scheduled to let in 2026 and early 2027 so that we can promptly assess implementation to ensure success. A sampling of projects and methods can be explored as we shift into this pilot.*



# 2025 Goal Number 5

Further Development of Sample Plan Sets.

- a) Move toward one standard plan set *per discipline* with **focus on integration**
- b) Provide living documents that evolve
- c) Include what standard deliverables look like



## **OPENX SAMPLE PLANSET**

**This sample planset is for demonstrating appearance, sheet layout, and plan preparation only. The design content is illustrative and not intended for design or construction use.**

**Refer to applicable Manuals, Standards, and Guidelines for actual design requirements. This sample is not a substitute for compliance with engineering standards.**

# 2026 Goal Number 5

## Develop Sample Plan Sets using the Unified Workspace in ORD 2024

Move toward one standard plan set *per discipline* with focus on integration

*This goal focuses on providing clear and well-developed example plan sets. Current examples have been provided from a sample of projects, but we do not have plan sets that have been specifically produced to serve as examples. Integration across disciplines is essential to this goal and thoughtful consideration should be given to deliverables of the future. Once standard plans are developed, they must be considered living documents and will need to have clear processes in place for keeping them current and published for external use.*

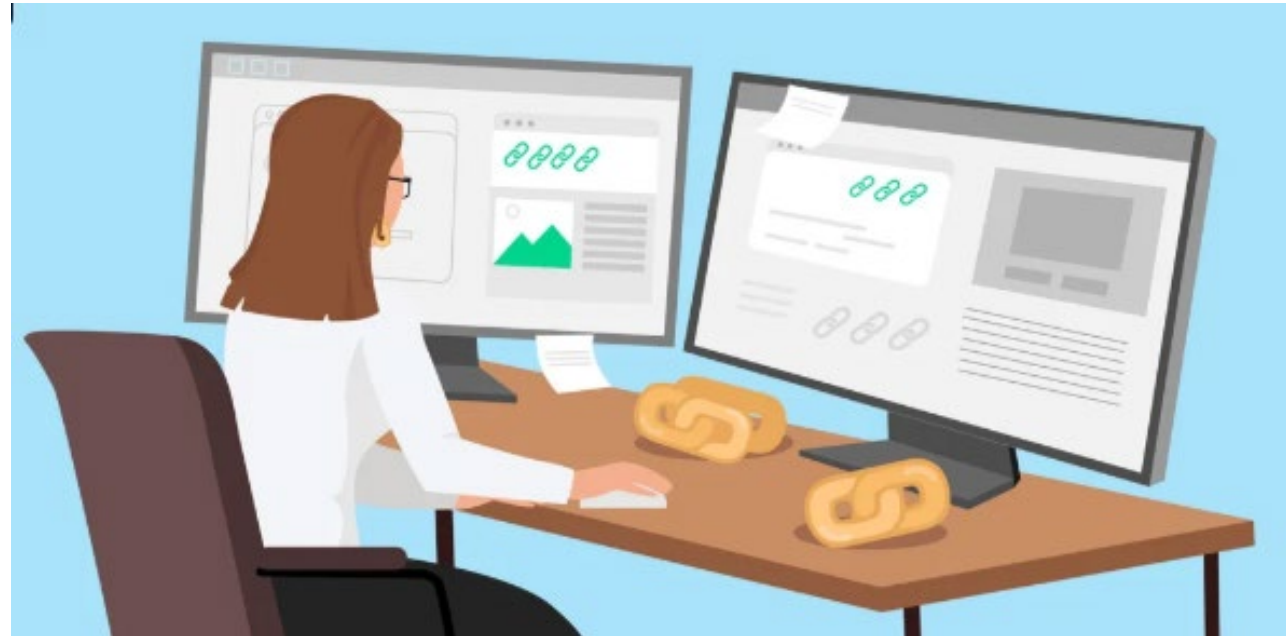
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# 2025 Goal Number 6

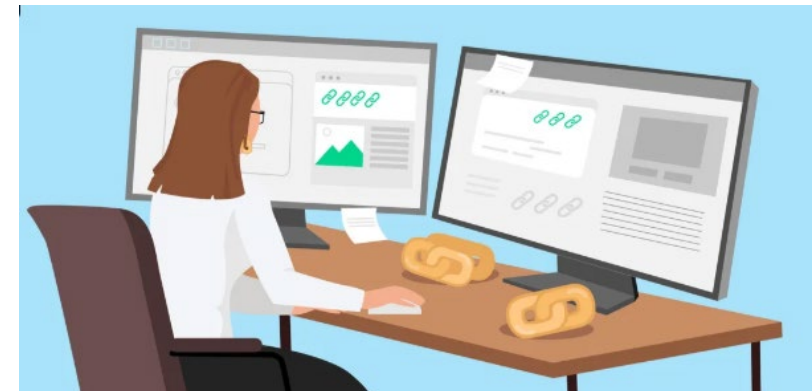
Define, Develop and Provide training with a focus on integration.



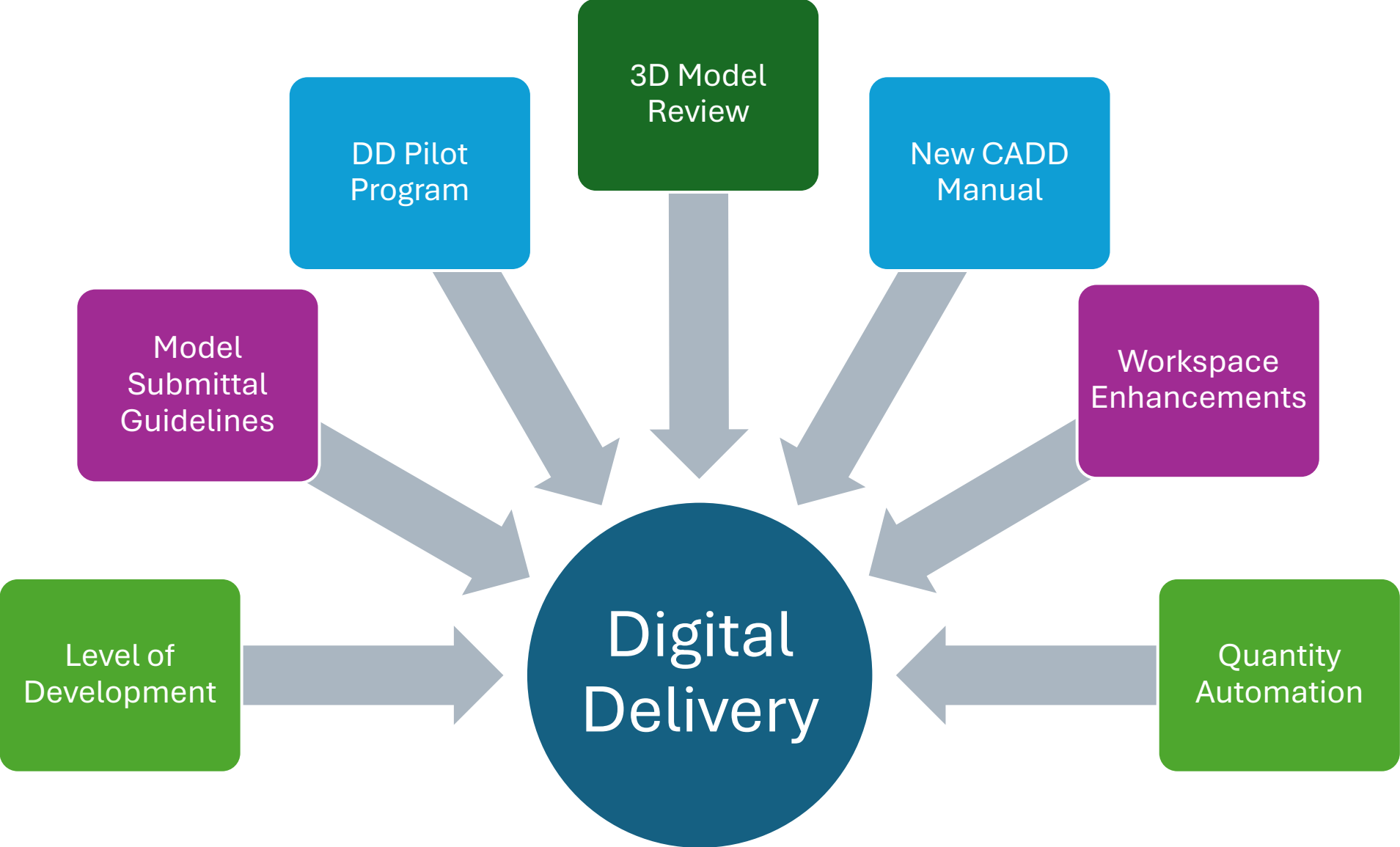
# 2026 Goal Number 6

## **Define, Develop and Provide training with a focus on integration**

*This goal focuses on the continued development and delivery of training to support implementation of new software, digital delivery workflows, and processes. In addition to addressing user needs within and beyond the preconstruction phase, this effort will include regular communication with internal and external partners through website updates, newsletters, and emails. A schedule for future training sessions will be established to allow sufficient time for developing high-quality training materials and resources.*



# Building the Foundation



# The State of our Program

## CURRENT

### Legacy (SS2/SS4/SS10)

- ~20-25% of projects still in
  - DDC
  - Bridges (delayed)
  - Spot Safety (Seeking funding)
  - Shelved/Other
- Risks
  - Security of Unsupported Software
  - Internal resource requirements to maintain workspaces & standards
  - Erosion of guidance & knowledge as we move away
  - Beyond Let, access to files needed during construction
  - Some disciplines have stopped working in this environment

### Open X (10.10)

- Don't know amount of 75% that are in 10.10
- Upgrading into 2024 will require more effort with less value
- Recommend keeping project in 10.10 through letting (2030)

### Open X (10.12/2023)

- ~75% of projects/program
  - Projects started and/or converted
- Guidance & training to-date has been done for these environments
- Software/workspace updates & file storage intended to be in Project Wise (does not equal working environment)
- Geared toward model production & might be more challenging for traditional plan production
- Supports model delivery however to date no established requirements
- Rapid changes to software over past years have proven challenging when incorporating/updating discipline specific workspaces

# The Unified Workspace for Open X 2024

## FUTURE

### Open X (2024)

- Software & new NCDOT workspace set to roll out early 2026
  - Planned minor update will follow
- New NCDOT workspace eliminates discipline specific workspaces and minimizes discipline preferences, streamlines ability to update and supports full model/software functionality
  - Testing is underway
- This workspace/environment will be the focus of digital delivery plan production improvements, training and guidance moving forward
  - Includes Level of Development and standardization to support model delivery
  - Introduces visual changes to plan sets requiring industry buy in and updates to QA/QC/plan checking processes

# Moving our Program

## CURRENT

### Legacy (SS2/SS4/SS10)

- ~20-25% of projects still in
  - DDC
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# Pilot Projects

## Digital Delivery Pilot Projects

Project ID	Divisions/Units	Project Description	Project Phases	Involved PEFs/Contractors	Pilot Targets
B-5777	Division 9	Bridge 58 over US 64 on NC 109	Construction	RS&H/APAC Atlantic	Construction Ready Model" provided to the contractor for feedback
BR-0015	Division 9	Bridge 280067 & 280068 on US 29/US 70 over SR 1192 (W 5th Avenue)	Construction	KCA	Construction Ready Model" provided to the contractor for feedback
BR-0168	Division 9	REPLACE BRIDGE 330289 ON SR 4000 (UNIVERSITY PKWY) OVER US52	Final Plans	NCDOT In-House	Potential "construction ready model" at letting (5/26)
I-6004	Division 7	I-40/I-85 AT SR 3056 (ROCK CREEK DAIRY ROAD)	Design Recommendation Plans	NCDOT In-House	This is a BIC Pilot Project
R-2247D	Division 9	WINSTON-SALEM NORTHERN BELTWAY FROM SR 1348 (ROBINHOOD ROAD - MEADOWLARK DRIVE) TO NC 67	Design Recommendation Plans	JMT	This is a BIC Pilot project
R-2247EA	Division 9	WINSTON-SALEM NORTHERN BELTWAY FROM NC 67 TO SOUTH OF US 52	Design Recommendation Plans	NCDOT In-House	This is a BIC Pilot project (REQUESTED)
BR-0254	Division 2	Replace Bridge 730016 on US 13 over Little Contentnea Creek		NCDOT In-House	This is a potential "NCDOT Workspace" Pilot Project
BR-0258	Division 12	REPLACE BRIDGE 170019 ON NC 16 BUS OVER US 70		NCDOT In-House	This is a potential "NCDOT Workspace" Pilot Project
BR-0260	Division 13	Replace Bridge 580026 on NC 226 over US 64 in McDowell County		NCDOT In-House	This is a potential "NCDOT Workspace" Pilot Project
R-5600	Division 14	NC 107 FROM NC 116 (WEBSTER ROAD) TO US 23 BUSINESS	Construction	NCDOT Resident support	NCDOT is supporting Resident's office in ORD setup & Trimble Workflow(project in V8i)
BR-0031	Division 14	BRIDGE 550226 ON SR 1310 OVER NANTAHALA RIVER.	Final Plans	NCDOT In-House	This is a potential "Conversion" Pilot Project - SSII to 2024 (LET moving to 2027)
BR-0052	Division 14	BRIDGE 550227 ON SR 1310 OVER NANTAHALA RIVER.	Final Plans	NCDOT In-House	This is a potential "Conversion" Pilot Project - SSII to 2024 (LET moving to 2027)
BR-0053	Division 14	BRIDGE 550228 ON SR 1310 OVER NANTAHALA RIVER.	Final Plans	NCDOT In-House	This is a potential "Conversion" Pilot Project - SSII to 2024 (LET moving to 2027)
BR-0001	Division 11	BRIDGE 020030 ON US 21 OVER LITTLE RIVER	Final Plans	NCDOT In-House	This is a potential "Conversion" Pilot Project - SSII to 2024 (currently letting 2030)



## NCDOT Digital Delivery - Pilot Project Nomination

NCDOT's office of Technical Services is soliciting submission for participation in a series of Digital Delivery pilot programs. The goal of these efforts is to help better inform decisions that shape project delivery policy and to evaluate the effectiveness of digital preconstruction to construction workflows. Project teams will deliver construction-ready models in addition to traditional PDF plan delivery. These construct-ready models will be delivered in formats that are intended to optimize the hand-off of data to Construction including Automated Machine Guidance (AMG) and Inspection. These files will not be signed and sealed but may undergo a review process for ensuring quality controlling. The following file formats are to be expected with the option for other efforts to be discussed prior to scoping: Controlling Alignment Files (Land XML), Final Grade/Top Surface (Land XML), Proposed Subgrade Surface (Land XML), Proposed Breaklines (DWG/DXF). Draft guidance policy will be provided in advance of initiation of this effort. In addition to these deliverables, project teams will be expected to complete an evaluation to provide a feedback cycle for future policy development as well as participate in routine progress meetings (monthly or biweekly). The department will make project coaching and training resource available to project teams for the purposed of streamline the development and review of the 3D model and resulting construction files.

When you submit this form, it will not automatically collect your details like name and email address unless you provide it yourself.

\* Required

### Contact Info

Please provide your information

1. Name \*

2. Email \*

3. Firm or Department \*



# CALL FOR PROJECTS

# Contact Us!



**Definition:** Digital Delivery is the use and transfer of digital data between preconstruction, construction, asset management and external consumers.



**Purpose:** To deliver data in a directly consumable format to maximize the benefits of the information for decision making and program delivery.

## About Digital Delivery

The rapid evolution of technology offers the opportunity for NCDOT to transition from traditional paper-based workflows in final design and construction to the use of digital tools and modeling. Digital Delivery will work to implement these tools and workflows on projects across the Department and state. Digital Delivery will also seek to connect disparate systems and/or applications to unlock value of data across the organization.

The Digital Delivery Team consists of representatives from various NCDOT Units, the consultant industry, and the construction industry. Relevant links from the various NCDOT Units working together to advance Digital Delivery can be found below. These will be refined and updated in the coming months.

## Current Digital Delivery Areas of Focus

### Preconstruction

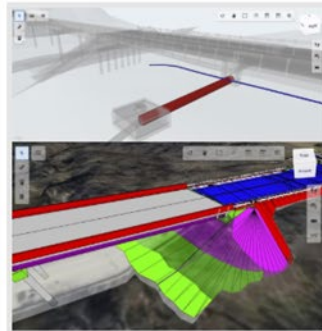
- Level of Development (COMING SOON)
- CADD Manual Version 3.0 (COMING SOON)
- Model Submittal Guidelines (COMING SOON)

### Construction

- Pilot Projects to Test
- Construction-Ready Models
- Drone Integration
- ETicketing
- Digital As-Builts
- Inspection



**DIGITAL DELIVERY**

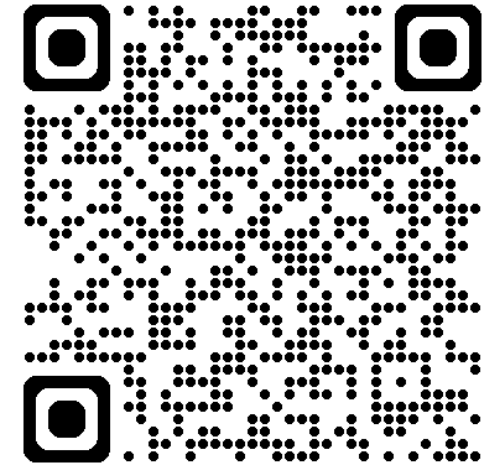


## Contact Us

[Digital Delivery Request Form](#)

[ORD Service Portal and Knowledge Base](#) (Requires NCID log in)

For other questions please send an email to: [DigitalDelivery2@ncdot.gov](mailto:DigitalDelivery2@ncdot.gov)



## Digital Delivery Requests

The Digital Delivery Team is committed to working with you and answers to your questions to aid the transition of digital delivery format.

We welcome your questions, needs, and concerns as your collaboration helps us achieve our shared goal of a future of digital delivery.

REQUESTOR'S NAME \*

REQUESTOR'S EMAIL \*

ORGANIZATION OR NCDOT UNIT

Please enter your firm name or NCDOT Unit.

Category \*

Request \*

Provide a general description of your request.

# Programmatic Tool Initiatives

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# Why PS&E Modernization Matters

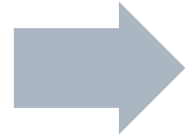
- Historically paper-based, spread across email, folders, shared drives, or inconsistent SharePoint paths.
- PMs lacked a single source of truth for deliverables, status, or readiness indicators.
- Final Plans were difficult to trace or confirm in time for QA.
- Reporting for 12MLL/15MLL required manual effort, spreadsheets, and back-and-forth communication.



# Goals & Outcomes

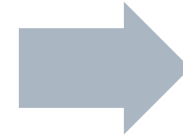
## Goals

- Improve reliability of the 12-Month Let List (12MLL)
- Standardize and automate the capture of PS&E deliverables
- Improve PS&E data quality by governing information at the source
- Create persistent, intelligent data that can feed future tools



## What We Did

- Integrated the PS&E Checklist into ATLAS Workbench to replace the paper checklist
- Added naming enforcement, metadata tagging, and Document Set governance
- Established a Power BI report
- Standardized file storage paths, versioning, and SharePoint integration
- Built the foundation for future data use across DOT



## Outcomes

- PMs and leadership now have consistent, governed status information
- Deliverables are properly named, versioned, and stored
- Clear visibility into readiness for 12 MLL and PS&E turn-in
- Efficient meetings: focus moves from status gathering to issue resolution

# Roles and Responsibilities

- PM Responsibilities:
  - Own PS&E Checklist; direct SMEs; monitor ATLAS daily; follow up on gaps
  - Confirm QA review can happen 2–4 weeks prior to PS&E date
  - Validate readiness for 15 MLL: ROW, Utilities, Permits, Municipal Agreements, Design Estimates
- **PEF and Project Team Responsibilities:**
  - **Assist PM in answering checklist questions accurately (15mll)**
  - **Provide document deliverables in correct format/timeline by uploading final documents into workbench as they are ready (not at the last minute)**
- Plan Review Responsibilities:
  - Conduct detailed reviews
  - Upload exported comments to ATLAS Plan Review Comments
  - Confirm deliverable completeness

# PS&E Checklist Using ATLAS Workbench

- Project Info U-5798B
- Project Structures
- ROW Parcel Status U-5798B

## Project Management

- Project Data
- Project Schedule

## Precon Tools

- Pay Items & Quantities
- Project Commitments
- Risk Assessment
- Submittal Tracker
- Avoidance and Minimization Tracker

## Processing Requests

- Grant Consulting Firm Access
- Grant Municipality Access
- Lock/Unlock Projects
- Unlock Pay Items

## Reference

- Preconstruction Help
- Discipline Specific Links

## ATLAS Tools

- ATLAS Workbench
- ATLAS Data Search Tool
- ATLAS Screening Tool

Construction site C205076

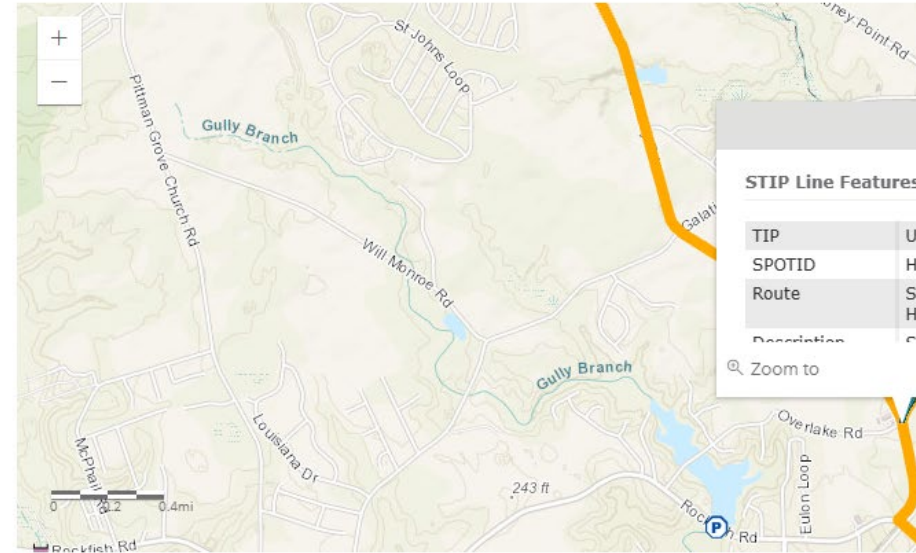


## Post LET

## ATLAS Tools

## Consulting Firm Access Summary

### Precon Project Map



Add / Edit Project Map

If you are unable to access the Scoping Workbench, please reach out to the ATLAS Helpdesk ([ATLAS@ncdot.gov](mailto:ATLAS@ncdot.gov))

# PS&E Checklist Using ATLAS Workbench

PS&E Checklist	
Key Documents	✓ ⓘ
Final Plan Sets	✓ ⓘ
Plan Review Comments	✓ ⓘ
Correspondence Docu-set Documents	✓ ⓘ
Roadway Supporting Documents	✓ ⓘ
Intermediate Contract Time (ICT's)	✓ ⓘ
Additional Information/Items	✓ ⓘ
Incomplete Items	✓ ⓘ

+ 4. Signed Environmental Document

- 5. NEPA/SEPA Consultation

Is NEPA/SEPA Consultation – ROW Consultation required?

Yes  No

3EP1. NEPA/SEPA Consultation – ROW Consultation Upload (PDF)

U-5798B\_ROWConsultation.pdf

Is NEPA/SEPA Consultation – Construction Consultation required?

Yes  No

4EP1. NEPA/SEPA Consultation – Construction Consultation Upload (PDF)

Status/Comments

750 character limit

- 6. Design Exceptions Documented and Approved

Are Design Exceptions required?

Yes  No

*The below upload should be the entire signed package of materials for the design exception*

2RD2. Approved Design Exception (PDF)

Status/Comments


# PS&E Checklist by Project Page

Group	Section	Header	Question	Answer	Expected Documents	Link	Comments	SME	Accepted Date	Quantities	
Key Documents	Regulatory Approvals	106 Consultations (Cultural Resources)	Are 106 Consultations (Cultural Resources) Regulatory Approvals required?	No							
		NFIP/CLOMR or SFC – one for each crossing (FEMA).	Are NFIP/CLOMR or SFC Regulatory Approvals required?	No							
		DEQ Water Permit (From Municipality)	Are DEQ Water Permit (From Municipality) Regulatory Approvals required?	Yes		<a href="#">🔗</a>					
		DEQ Sewer Permit (From Municipality)	Are DEQ Sewer Permit (From Municipality) Regulatory Approvals required?	No							
		Permits	Are Permits/Regulatory Approvals required?	Yes							
	Signed Environmental Document	Signed Environmental Document		Is Signed Environmental Document required?	Yes						
				Are Signed Environmental Document complete?	Yes						
			Categorical Exclusion				<a href="#">🔗</a>				
	NEPA/SEPA Consultation	NEPA/SEPA Consultation		Is NEPA/SEPA Consultation — ROW Consultation required?	Yes		<a href="#">🔗</a>				
				Is NEPA/SEPA Consultation — Construction Consultation required?	Yes		<a href="#">🔗</a>				
	Design Exceptions Documented and Approved Traffic Forecast	Design Exceptions Documented and Approved Traffic Forecast		Are Design Exceptions required?	No						
				Is Traffic Forecast required?	Yes		<a href="#">🔗</a>				
	Final Plan Sets	Plan Set Type	100 Roadway Plans	Are 100 Roadway Plans required?	Yes						
Are 100 Roadway Plans completed?				Yes			Piotr Stojda	08/12/2025	AWP		
100 Roadway Special Provisions						<a href="#">🔗</a>					
150 Right of Way			Are 150 Right of Way required?	Yes							
			Are 150 Right of Way Plans completed?	Yes			Christopher Lewter	2/29/2024	N/A		
200 Transportation Management Plans			Are 200 Transportation Management Plans required?	Yes							
			Are 200 Transportation Management Plans completed?	Yes			The TMP, ICT document, and Michael Steelman	10/01/2025	AWP		

# Contact Us

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