



NORTH CAROLINA Department of Transportation



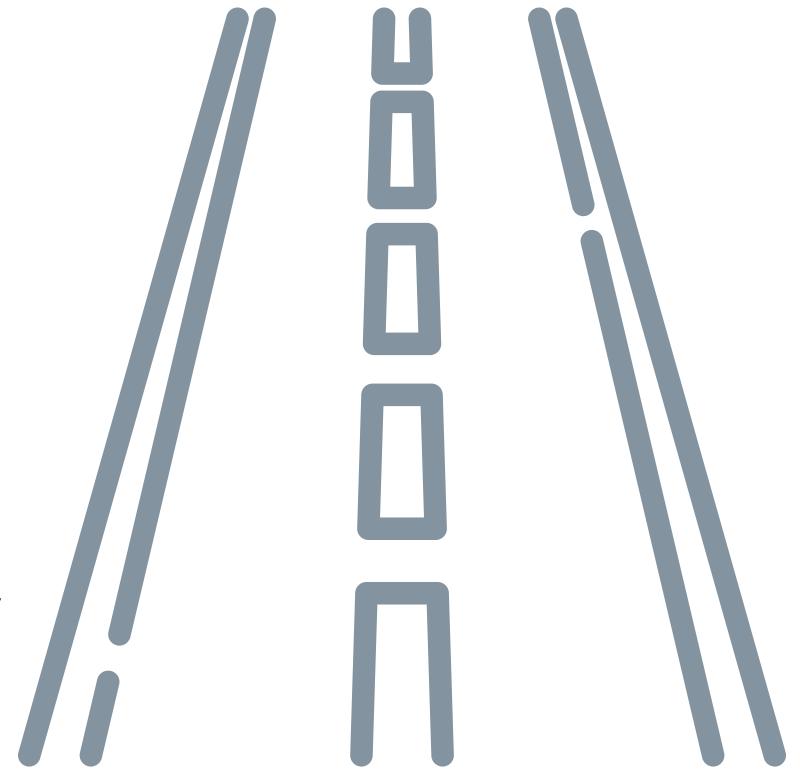
NCDOT ORD Implementation

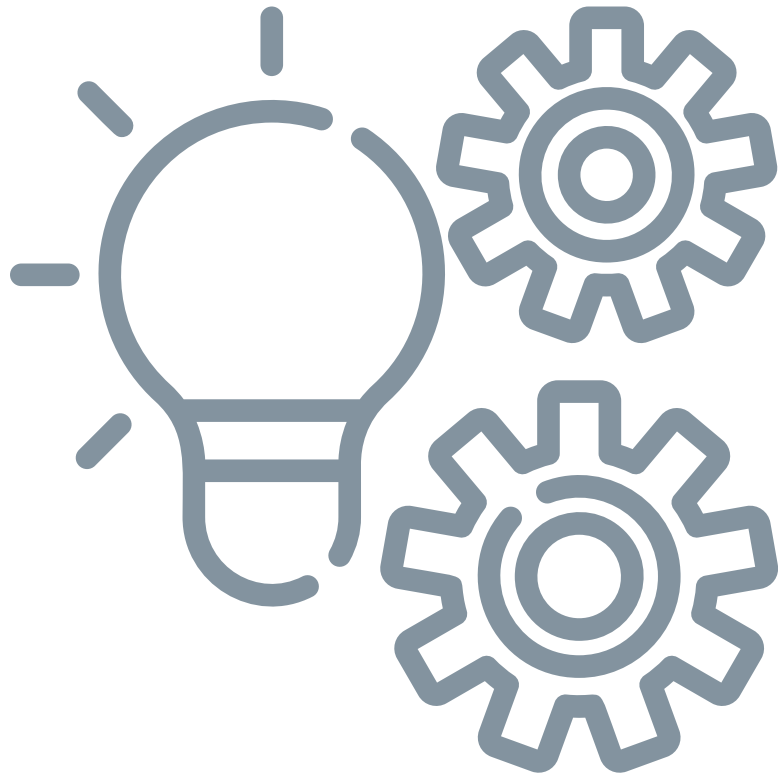
Roger Kluckman, PE & Jonathan Langley, PE

July 25, 2019

15,000 miles of primary highways

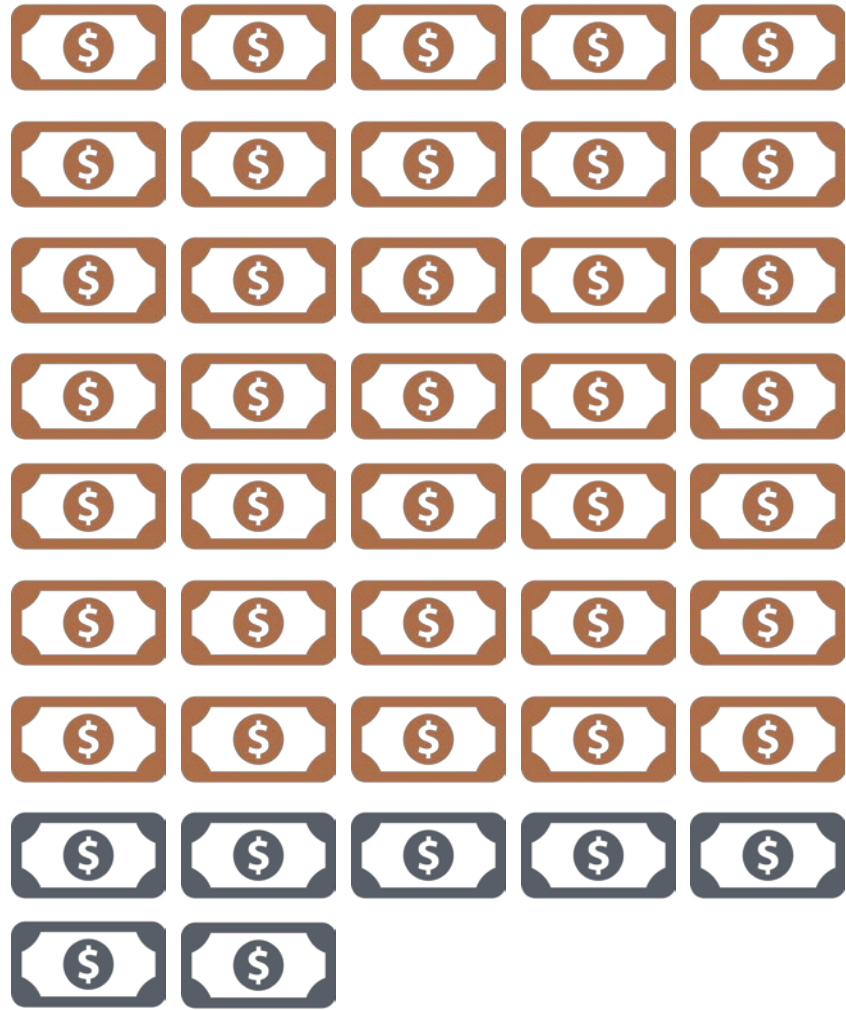
65,000 miles of secondary roads






6 6 1

Projects Last Year



Project Letting (2018) \$4.2B

Central Letting: \$3.5 Billion
Districts: \$719.6 Million

 = \$100,000,000

9,418
NCDOT Staff





NCDOT & Consultants

What is the value of 3D Design?

VALUE TO ENGINEERS

- ✓ Identify issues in design prior to construction
- ✓ Utilize Intelligent Design
- ✓ Identify Drainage & Utility conflicts
- ✓ More accurate design from model
- ✓ Provides 3D visualizations for stakeholders

VALUE TO CONTRACTORS

- ✓ Models and automated machinery work in tandem
- ✓ Accurate calculation of quantities
- ✓ Accurate model decreases construction issues
- ✓ More efficient grading
- ✓ Limited or no survey staking required



Corridor Modelling

Parametric Modelling

Increased Accuracy

Civil Cells

New Sheet Production
Tools

Real-time Design
Updates

Visualization Tools

All Design Stored in
DGN Format

Directly Export Models
for Contractors



Why Upgrade to OpenRoads Designer?

Bentley's OpenRoads Designer (ORD) will continue to offer the same CADD functionality that current users are familiar with.

ORD was created to incorporate **Design Intent**. This means that design information is stored within individual objects. These objects remember their relationships to other associated elements and update automatically when change are made.

Bentley will be discontinuing support for older versions of Microstation V8i and Geopak in January of 2020.

NCDOT Readiness Assessments



Where are
we now?



Where are
we going?

NCDOT Readiness Assessments

Awareness



Planning



Implementing



Understanding



Testing/Training



NCDOT Readiness Assessments



HARDWARE & SOFTWARE

It is important to understanding what current software applications are being used in order to establish a transition plan. It is also important to understand what hardware is currently being used to ensure that it is compatible with ORD.



WORKFLOW

Each unit has specific processes and workflows that are regularly used to get your work done. It is possible that the shift to ORD will require some of these processes to be reexamined.



PERSONNEL

The team members within each unit are at the core of the NCDOT's work. It is important to ensure that personnel understands what this ORD transition means for them. ORD education or training will be needed at various levels within the unit, ranging from production staff to management staff.

NCDOT Readiness Assessments

Units Already Interviewed for Readiness Assessment

Hydraulics

Roadway Design

Feasibility Studies

Structures Management

Utilities

ITS and Signals

Geotechnical Engineering

Location and Surveys

Photogrammetry

Signing and Delineation

Work Zone Traffic Control

CADD Services

Plans and Standards Management

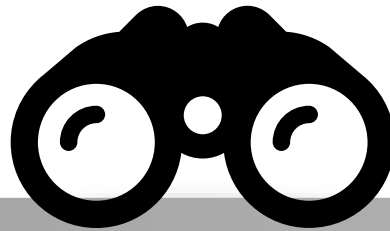
Roadside Environmental

NCDOT Readiness Assessments

Understanding



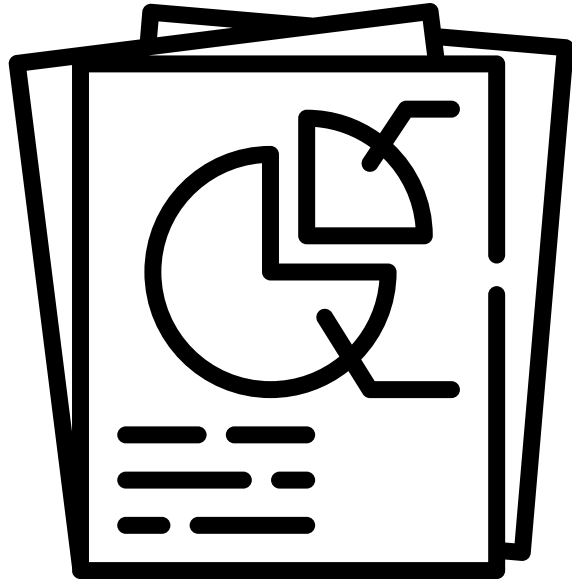
Planning



Testing/Training



NCDOT Implementation Plan



PART I
Readiness
Assessment



PART II
Department-Wide
Implementation
Plan



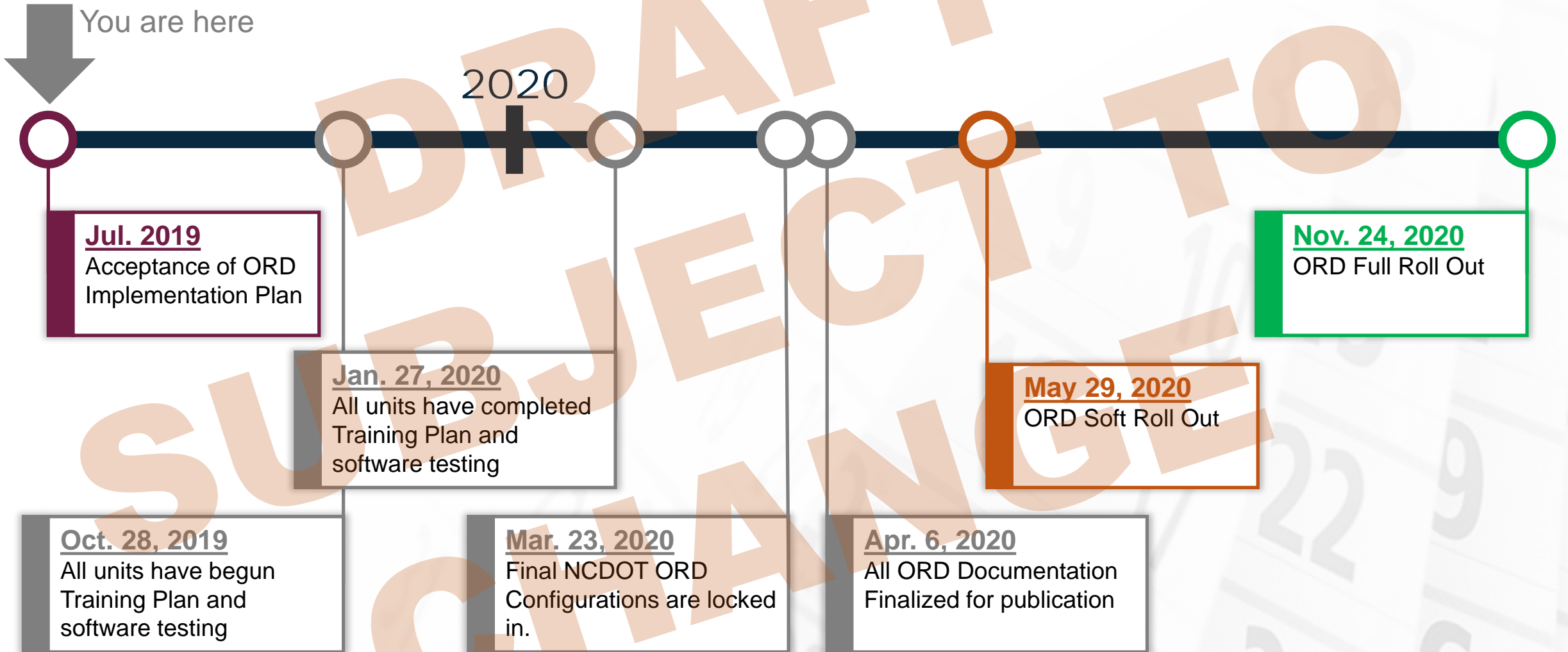
PART III
Unit-Specific
Implementation
Recommendations

DRAFT
FOR REVIEW

ORD Implementation Schedule

Milestone Goal	Milestone Date
All Units Adopt ORD Implementation Plan	Week of July 22, 2019
All Units have begun Testing and Training	Monday, October 28, 2019
All Units have completed at least 3 test projects	Monday, January 27, 2020
All Units have completed their Training Plan	Monday, January 27, 2020
Final build of all NCDOT ORD configurations are locked in	Monday, March 23, 2020
All ORD user documentation is finalized for publication	Monday, April 6, 2020
ORD Soft Roll Out	Friday May 29, 2020
ORD Full Roll Out	Tuesday, November 24, 2020

ORD Implementation Schedule



Testing Process



Pilot Projects

- Already Underway
- Completed 25% Design
- Tangible Results
- Constrained to Project Schedule



Testing Scripts

- Full Regression Testing
- Units Define Scripts
- Flexible Schedules
- Independent Testing Schedule

Bentley Quarterly ORD Releases

Release Type	Anticipated Date
Minor	July 2019
Major	October 2019
Minor	July 2020
Major	October 2020

Note: Release dates are anticipated based on Bentley's previous release frequency. Actual release date timing is outside of NCDOT control.



ORD SOFT ROLLOUT
May 29, 2020*

*Draft Date: Subject to Change



Soft Rollout



Voluntary ORD for Soft Roll Out



Opt-In Process



Duration: ~ 6 months



Workspace refinement continues,
as needed

Soft Rollout Who Should Consider Participating?



New
Projects



Longstanding
Projects



For Training
& Practice

ORD FULL ROLLOUT

Beginning on NOVEMBER 24, 2020* all projects that have not yet received 30% Plan Approval will be required to adopt ORD.

Waiver Process



Waiver Submittal

A waiver can be submitted for projects that are not required to transition to the use of ORD.



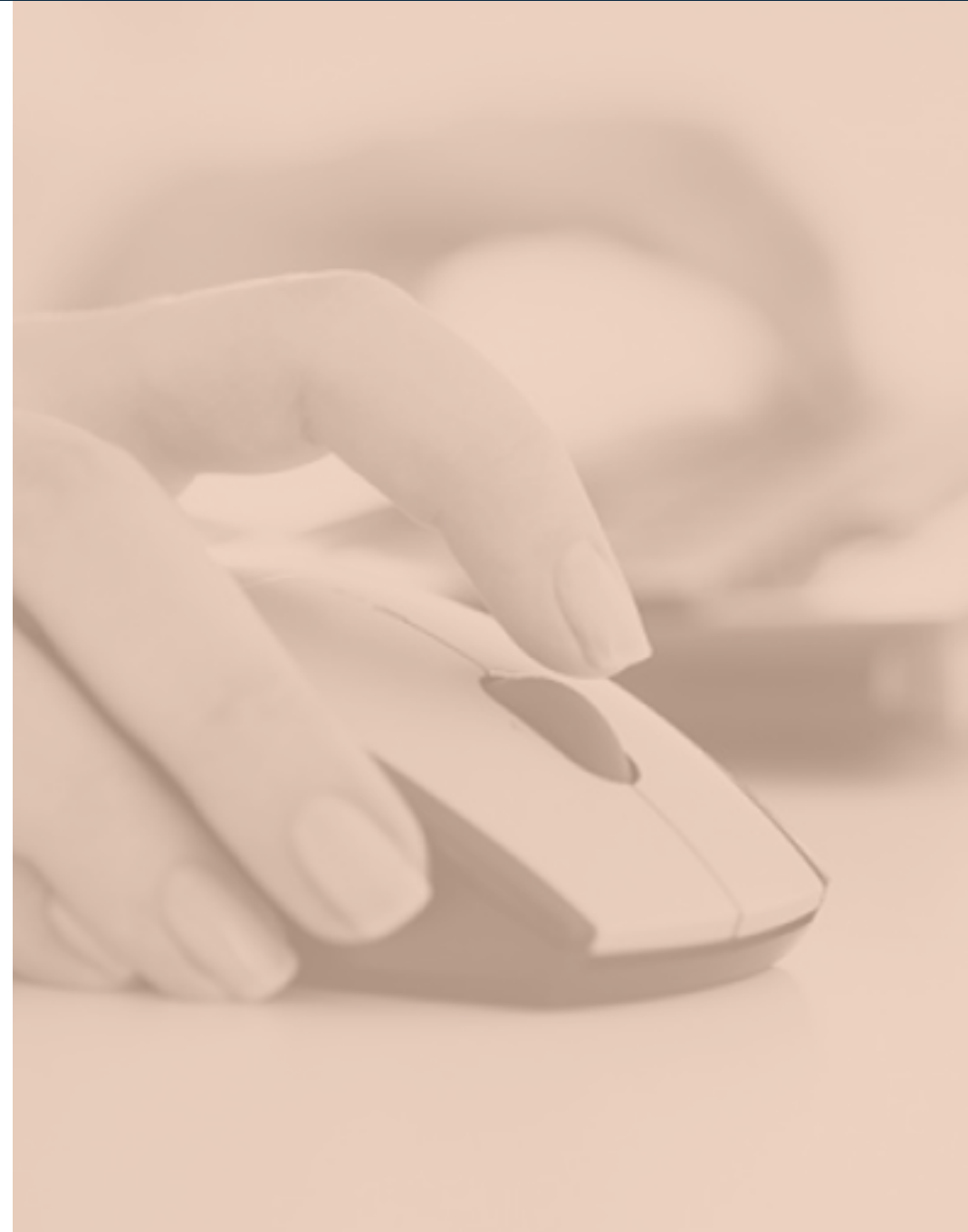
NCDOT Project Manager Role

Submittal of the waiver is the responsibility of the NCDOT Project Manager.

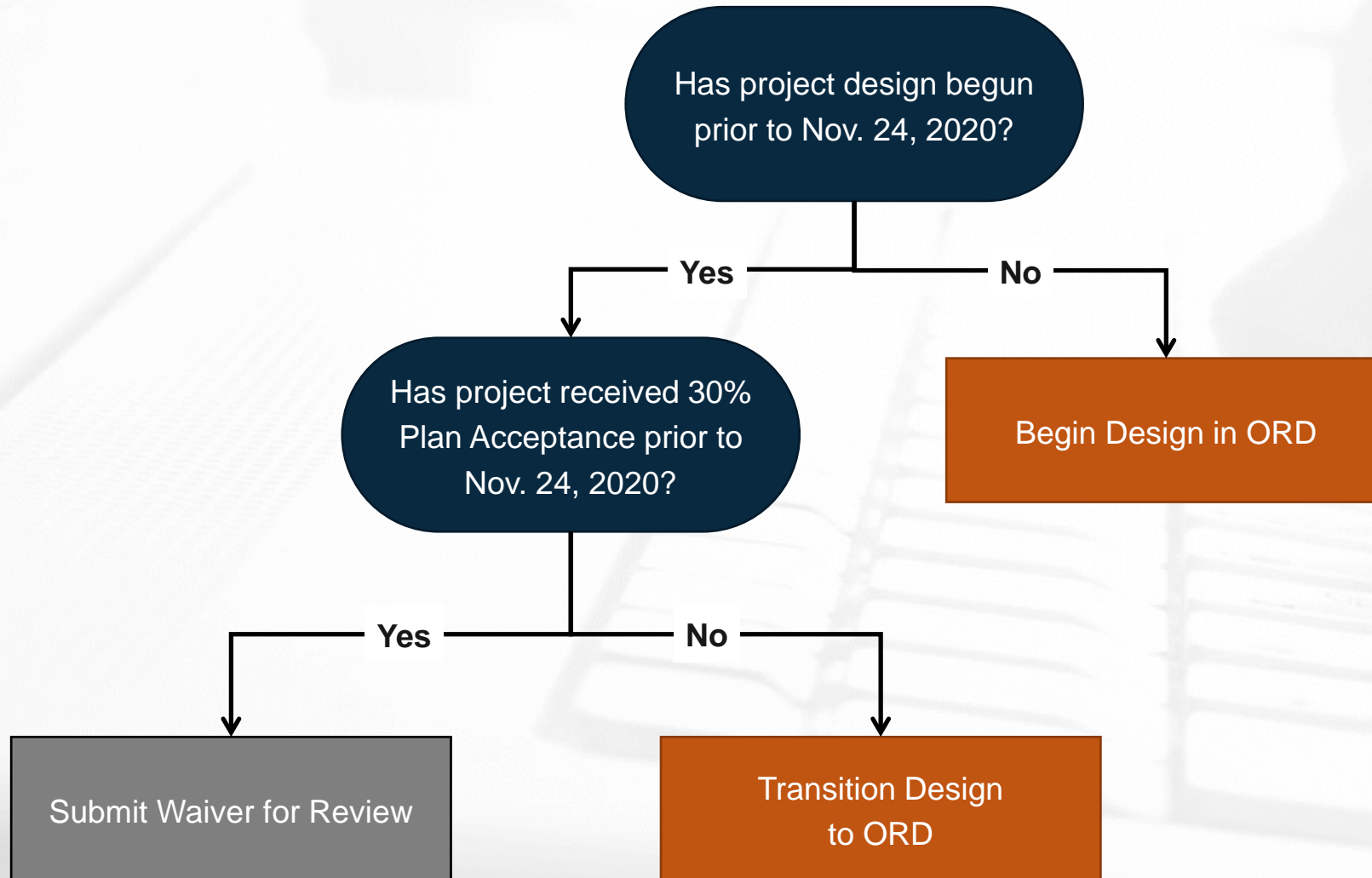


Consultants

The NCDOT Project Manager will coordinate with consultants to determine if a project is eligible for a waiver.



Waiver Process





Legacy Projects



What qualifies as a legacy project?



Maintaining access to legacy hardware, software, and workspace configurations



Final decision is up to the discretion of NCDOT Management

Communications Plan

Methods of Communication

Monthly Digital
Newsletter

Progress Reports to
Senior Management

Fact Sheets

Memos

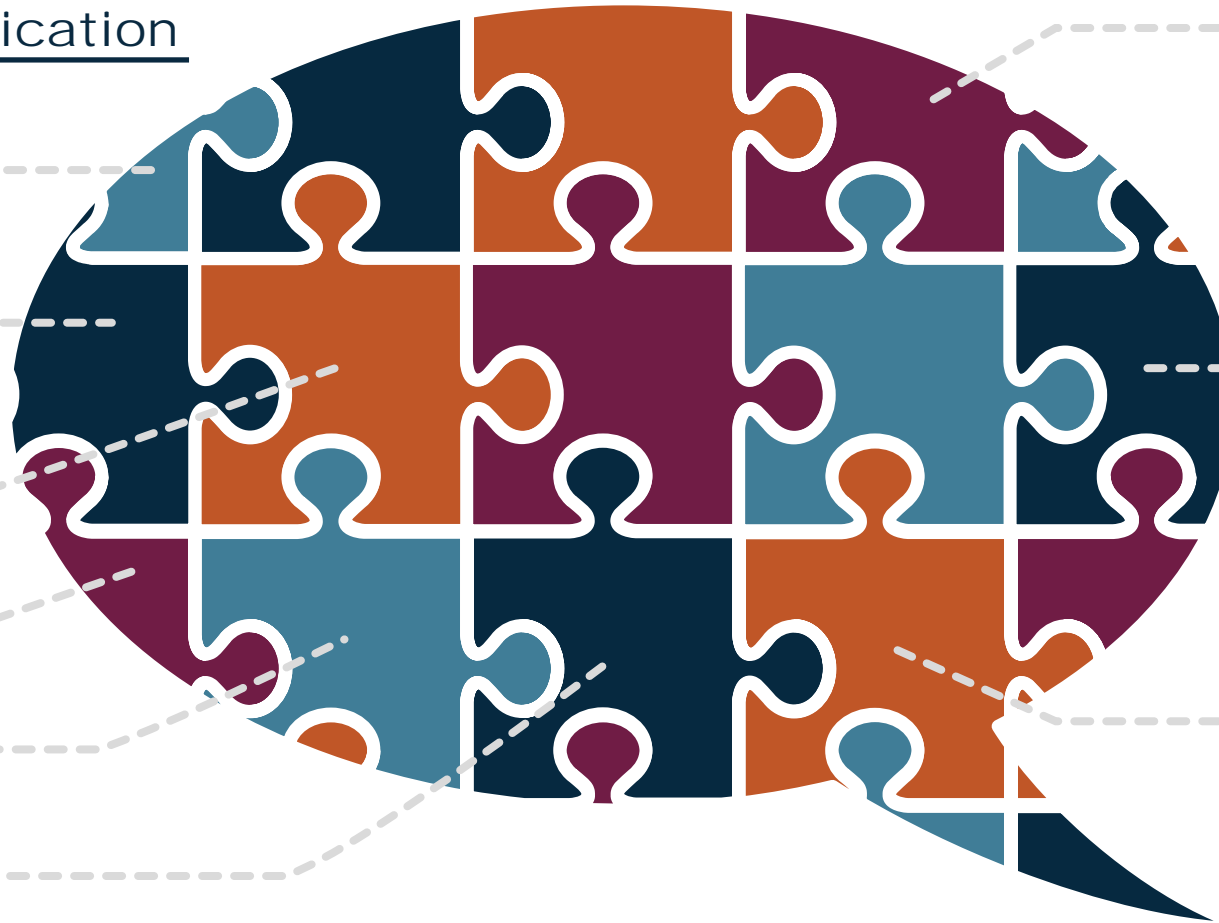
Presentations

Coordination Meetings

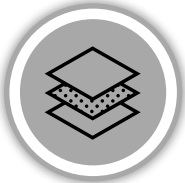
Internal
Communications

External
Communications

Two Way
Communications



Training Plan



Training Levels

- General Training – basic tasks, accessible to anyone, navigation and familiarity
- Focused Training – discipline specific, more detailed



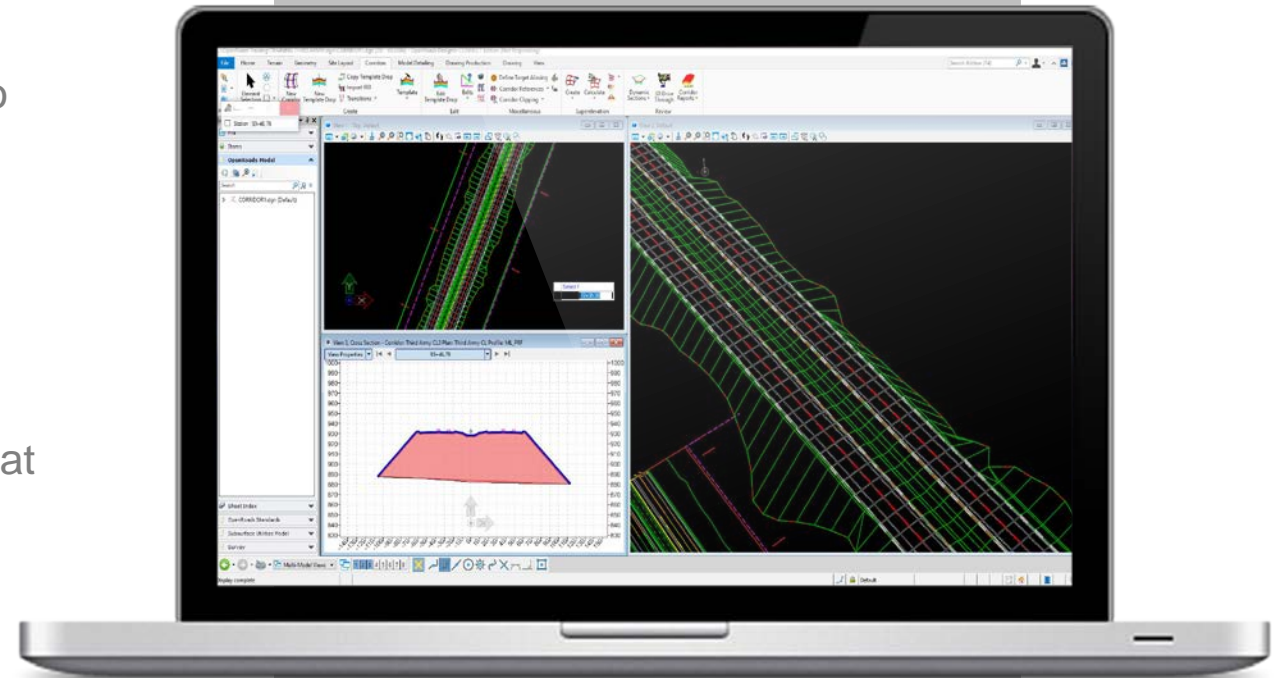
Unit Training

Units will identify who they need to train and what focused training they will need



Internal vs. External Training

The training plan will describe the approaches that will be used for NCDOT staff and external consultants based on trainees needs.



Internal NCDOT Goal

Train 80% of applicable
NCDOT Staff by
JANUARY 27, 2020*

*Draft Date: Subject to Change

Training Plan



ORD Working Groups

INTERNAL

Begins upon adoption
of ORD Implementation
Plan



EXTERNAL

Begins upon ORD
Rollout

Anticipated Frequency: Monthly

Roles Working Groups

Coordinate transition process

Disseminate technical information

Discuss challenges and barriers

Collect feedback

Track progress of development updates



Workspaces

Complete or Nearing Completion

- Roadway Design
 - Also used by:
 - Feasibility Studies
- Structures Management
- Hydraulics
- Geotechnical Engineering

Under Construction

- Geotechnical Engineering
- Utilities
- ITS and Signals
- Signing and Delineation
- Work Zone Traffic Control
- Location and Surveys
- Roadside Environmental

Not Started

- Photogrammetry

Not Critical Need

- Plans and Standards Management

THANK YOU

