15,000 miles of primary highways

65,000 miles of secondary roads
661 Projects Last Year
Project Letting (2018)

$4.2B

Central Letting: $3.5 Billion
Districts: $719.6 Million
9,418
NCDOT Staff
NCDOT & Consultants
# What is the value of 3D Design?

<table>
<thead>
<tr>
<th>VALUE TO ENGINEERS</th>
<th>VALUE TO CONTRACTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Identify issues in design prior to construction</td>
<td>✓ Models and automated machinery work in tandem</td>
</tr>
<tr>
<td>✓ Utilize Intelligent Design</td>
<td>✓ Accurate calculation of quantities</td>
</tr>
<tr>
<td>✓ Identify Drainage &amp; Utility conflicts</td>
<td>✓ Accurate model decreases construction issues</td>
</tr>
<tr>
<td>✓ More accurate design from model</td>
<td>✓ More efficient grading</td>
</tr>
<tr>
<td>✓ Provides 3D visualizations for stakeholders</td>
<td>✓ Limited or no survey staking required</td>
</tr>
</tbody>
</table>
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.

Why Upgrade to OpenRoads Designer?

- 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?
NCDOT Readiness Assessments

Where are we now?

Where are we going?
NCDOT Readiness Assessments

- Awareness
- Understanding
- Planning
- Testing/Training
- Implementing
It is important to understand 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.

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.

The team members within each unit are at the core of the NCDOT’s work. It is important to ensure that personnel understand 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
## ORD Implementation Schedule

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

- **2020**
  - **Oct. 28, 2019**: All units have begun Training Plan and software testing
  - **Jan. 27, 2020**: All units have completed Training Plan and software testing
  - **Mar. 23, 2020**: Final NCDOT ORD Configurations are locked in.
  - **Apr. 6, 2020**: All ORD Documentation Finalized for publication
  - **May 29, 2020**: ORD Soft Roll Out
  - **Nov. 24, 2020**: ORD Full Roll Out
  - **2019**
    - **Jul. 2019**: Acceptance of ORD Implementation Plan
    - **Oct. 28, 2019**: All units have begun Training Plan and software testing
    - **Jan. 27, 2020**: All units have completed Training Plan and software testing

You are here
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

<table>
<thead>
<tr>
<th>Release Type</th>
<th>Anticipated Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor</td>
<td>July 2019</td>
</tr>
<tr>
<td>Major</td>
<td>October 2019</td>
</tr>
<tr>
<td>Minor</td>
<td>July 2020</td>
</tr>
<tr>
<td>Major</td>
<td>October 2020</td>
</tr>
</tbody>
</table>

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

*Draft Date: Subject to Change
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

Has project design begun prior to Nov. 24, 2020?

- Yes
  - Has project received 30% Plan Acceptance prior to Nov. 24, 2020?
    - Yes
      - Submit Waiver for Review
    - No
      - Transition Design to ORD
  - No
    - Begin Design in ORD
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

TRAINING FORMATS

Various formats will be considered for the general and focused training. The training plan will designate which format is recommended for each training.

- Live Classroom Sessions
- Webinars
- Video Training
- Written Tutorials and Documents
- 3rd Party Training Options
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