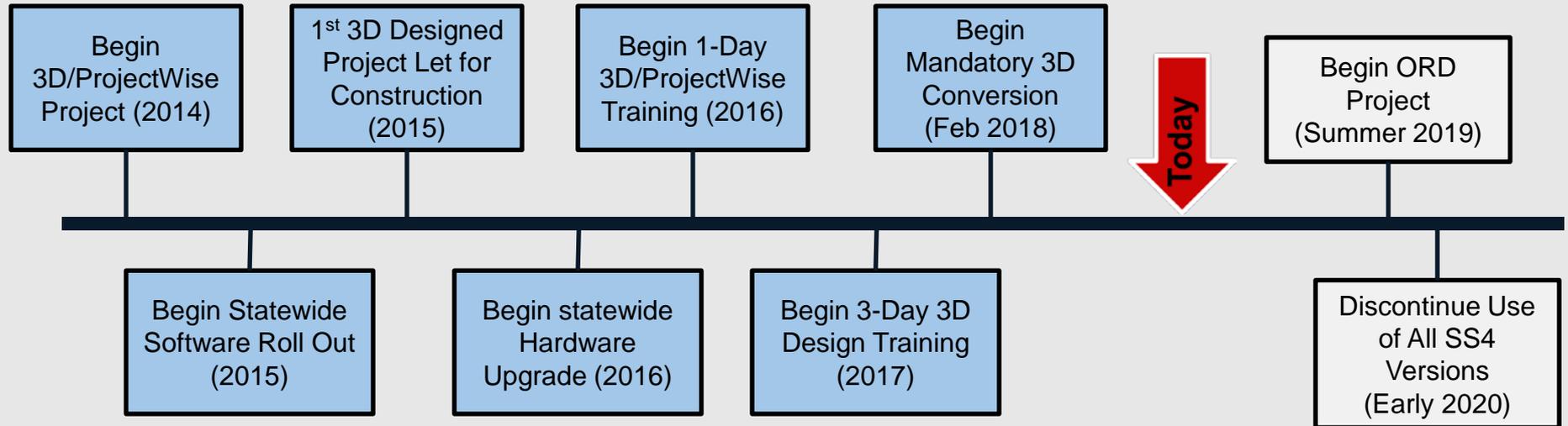




3D DESIGN IMPLEMENTATION

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3D Design Implementation



3D Policy Email February 2018

In 2015 TxDOT began a transition to a new 3D design workflow by adopting the OpenRoads technology offered in the SS3 version of GeoPak. Since then many designers statewide have upgraded to the more robust SS4 version of GeoPak.

Current Upgrade

In an effort to provide for more uniformity in our design and eliminate incompatibility issues between GeoPak SS3 and GeoPak SS4 users, all users statewide will be upgraded to the SS4 version of Power GeoPak by the end of Feb 2018.

Future Upgrade

Further upgrades to our civil design software are currently being planned. It is anticipated that the next upgrade, to Open Roads Designer (ORD) Connect Edition, will begin approximately summer 2019.

While the upgrade to Power GeoPak SS4 is virtually seamless to designers, the upgrade to ORD Connect Edition may have a greater impact, but primarily for those who have not transitioned to the OpenRoads technology adopted in 2015. Unlike the SS3/SS4 versions of GeoPak, ORD Connect Edition will no longer have the classic GeoPak geometric design tools used by TxDOT designers for over twenty years. Even though it has been three years since TxDOT adopted the OpenRoads technology, recent communications have shown that a large percentage of projects statewide are still being developed with the old GeoPak technology.

Who

What

Where

When

Why

How

Who

- Includes
 - “in-House” Design Projects
 - Consultant Design Projects
- Doesn't Include
 - Local Let Projects
 - Design Build Projects

What

- Includes
 - All construction projects that require geometric design
 - Rehabilitation Projects(3R)
 - Reconstruction Projects(4R/5R)
- Doesn't Include
 - Seal Coat/Overlay Projects
 - Restoration Projects (2R)

Where

- DES 727 Training Class
 - <https://www.txdot.gov/business/consultants/architectural-engineering-surveying/3d-openroads.html>
- 3D GeoPak Workspace files
 - <https://www.txdot.gov/business/resources/information-technology/geopak.html>

When

- All new projects as of February 2018 must be design in 3d.
- All existing Projects must be converted to 3D.
- Two exceptions to converting existing projects
 - Any project that was more than 90% design complete as of February 2018
 - OR
 - Any project that will let prior to January 2019

Why

- Safety
- Increased productivity
 - Design
 - Construction
- ROI

How

- Project Conversion Requires
 - GeoPak geometry data imported from existing GPK
 - Develop project templates
 - Use geometry and templates to create corridors
 - Use the model to generate design cross sections
 - Use the model to calculate proposed earthwork
- Project Conversion **Doesn't** Require
 - Adding the corridors models to already cut sheets

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Form 1002 (Rev. 2018)
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B. STIP Status

C. Environmental Status

D. Financing (Click on (+) to ADD items (-) to DELETE items)

CSJ	Work Program No.	Authorized Funds	Estimated Funds (excl. E&C & other part.)	Overrun/Underrun (+/-)
		\$	\$	\$
		\$	\$	\$
		\$	\$	\$
Total		\$	\$	\$

Attach district justification explaining overruns of programmed amounts. (In accordance with current Department Program Overrun policy.) [\[Show form field below for short justification\]](#)

Other Participation:

	Amount	Indicate Fixed Sum or Actual Cost	Authorization Minute Order No.
County:	\$		
City:	\$		
Other (Specify):	\$		

Attach any necessary funding agreements.

E. Agreements

(1) Railroad Agreements
 Required: Yes No
 Date Executed: _____ Name of Railroad: _____
 If Not Executed, Date Request Sent to Rail Division: _____

(2) Other Agreements Required: Yes No
 Name of Agency: _____
 Purpose: _____
 Executed Yes No If not executed, provide status: _____

F. Airway-Highway Clearance
 Required: Yes No Date Approved: _____

G. Contract Time
 Working Days: _____

H. District Contact Person(s)
 Name: _____ Telephone No.: _____
 Fax No.: _____

I. Pedestrian Elements
 Estimated Cost \$: _____

J. Project submitted to TDLR (through Registered Accessibility Specialists) for review. Yes No
 If Yes, submit a copy of the project TDLR Registration Form to DES with the plan set.

K. Type of 3D model developed
 Basic Corridor Model Automated Machine Guidance Model Visualization Model

If Yes, submit a copy of the project TDLR Registration Form to DES with the plan set.

K. Type of 3D model developed

- Basic Corridor Model Automated Machine Guidance Model Visualization Model

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Advanced Project Development Elements

A. Surveying

1. Is planimetric needed? Yes No
2. Status of aerial photography: complete in progress not started not proposed
3. Status of field survey: complete in progress not started
4. Has vertical and horizontal control been established on the ground? Yes No
5. Additional elements to be surveyed (drainage channels, intersecting streets, etc.):

6. Is existing ROW staking required? Yes No
Status: complete in progress not started Responsible office:
7. Comments:

B. Schematic development

1. Is a geometric schematic required? Yes No If yes, responsible office:
2. Is a signing schematic required? Yes No
3. Schematic status:
a. Percent complete: % b. Approval authority: FHWA DES District
c. Need preliminary schematic by: d. Need approved schematic by: e. Approval date:
4. What type of 3D model will be developed? (Choose all that apply)
 Basic Corridor Model Automated Machine Guidance Model Visualization Model
5. Comments:

C. Environmental Commitments & Issues

1. Anticipated type of environmental document required: CE EA EIS
2. Office responsible for preparing environmental document:
3. Has environmental document been approved? Yes No Status:
4. Public meetings: proposed not proposed scheduled held MAPO
Date(s):
5. Public hearing: scheduled opp. afforded held not required Date:
6. Environmental commitments
a. Noise:
b. Air quality:
c. Wetlands/Section 404 Permits:
1. Individual permit required?
2. Nationwide permit required?
d. Water quality:
e. Coast Guard:
f. Natural resources:
1. Vegetation:
2. Endangered Species:
3. Other:
g. Cultural resources:
1. Archeology:
2. Historical:
h. Social, economic, environmental justice:
i. 4f, 6f:
j. Other:
7. Are hazardous materials issues anticipated? Yes No
8. Environmental Issues Permits Commitments Sheet (EPIC) completed? Yes No
9. Office(s) responsible for fulfilling commitments:
10. Comments:

c. need preliminary schematic by: d. need approved schematic by

4. What type of 3D model will be developed? (Choose all that apply)

Basic Corridor Model

Automated Machine Guidance Model

Visualization Model

5. Comments:

3D Design Implementation - Questions

For cross section development, can they be broken down by cut/fill by phase? Will the 3-D model be shared with the contractors pre-bid?

Yes, cross sections can be broken down in terms of cut/fill by phase. We consider this to be a best practice. This information can be shared with contractors pre-bid in xml format.

Did you say earlier that the cross section of a road (developed from a 3D model) passing under a bridge does or doesn't include bridge elements such as columns, bents, girders, etc?

Some bridge elements may be eliminated from the model, but the earthwork would then need to be calculated by hand. Eliminating bridge elements is permissible in this scenario because robotic equipment is not expected to need a 3D model to work in that area.

Is temporary special shoring included in 3d model deliverables to contractor?

It should be shown in phased cross sections.

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