Begin 3D/ProjectWise Project (2014)

Begin 1st 3D Designed Project Let for Construction (2015)

Begin 1-Day 3D/ProjectWise Training (2016)

Begin Mandatory 3D Conversion (Feb 2018)

Begin ORD Project (Summer 2019)

Begin Statewide Software Roll Out (2015)

Begin statewide Hardware Upgrade (2016)

Begin 3-Day 3D Design Training (2017)

Discontinue Use of All SS4 Versions (Early 2020)
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 incompatibly issues between GeoPak SS3 and GeoPakk 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
3D Design Implementation

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)
3D Design Implementation

Where

- DES 727 Training Class

- 3D GeoPak Workspace files
All new projects as of February 2018 must be designed 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
- Any project that will be let prior to January 2019
3D Design Implementation

**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
### 3D Design Implementation

#### K. Type of 3D model developed

- Basic Corridor Model
- Automated Machine Guidance Model
- Visualization Model
# 3D Design Implementation

## Advanced Project Development Elements

### A. Surveying

<table>
<thead>
<tr>
<th>Task</th>
<th>Yes</th>
<th>No</th>
<th>In Progress</th>
<th>Not Started</th>
<th>Not Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is 3D photogrammetry needed?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Status of aerial photography</td>
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<tr>
<td>3. Status of field surveys</td>
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</table>

### B. Schematic Development

<table>
<thead>
<tr>
<th>Task</th>
<th>Yes</th>
<th>No</th>
<th>In Progress</th>
<th>Not Started</th>
<th>Responsible Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is a preliminary schematic required?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>If yes, responsible office</td>
</tr>
<tr>
<td>2. Is a final schematic required?</td>
<td></td>
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<td></td>
<td>No</td>
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</table>

### C. Environmental Considerations & Issues

<table>
<thead>
<tr>
<th>Task</th>
<th>Yes</th>
<th>No</th>
<th>In Progress</th>
<th>Not Started</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Anticipated types of environmental document required</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CE/EA/ES</td>
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<tr>
<td>2. Office responsible for preparing environmental documents</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3. Has environmental document been approved?</td>
<td></td>
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<td></td>
<td>Yes/No</td>
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<tr>
<td>4. Public meetings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>proposed/not proposed/scheduled/held</td>
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<tr>
<td>5. Public hearing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>scheduled/approved/held/not required/Date</td>
</tr>
</tbody>
</table>

## 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. need preliminary schematic by:
- a. need approved schematic by:
- d. other comments:
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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