TopoDOT®

TopoCloud™

TopoPlanner

TopoMission

A Comprehensive Application Suite for LiDAR Project Planning, Data Storage, Data Management and 3D Model Extraction

Presented by:
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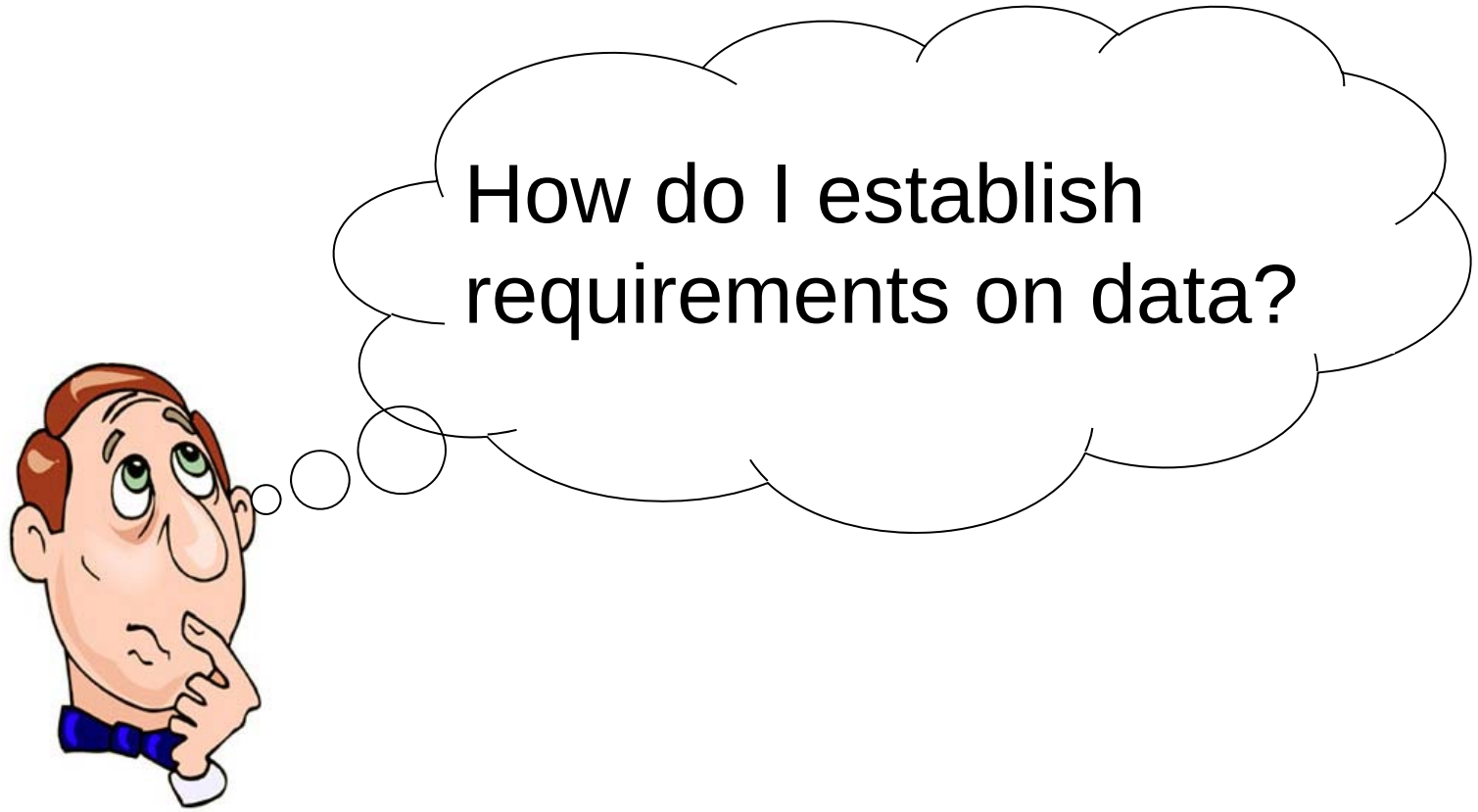
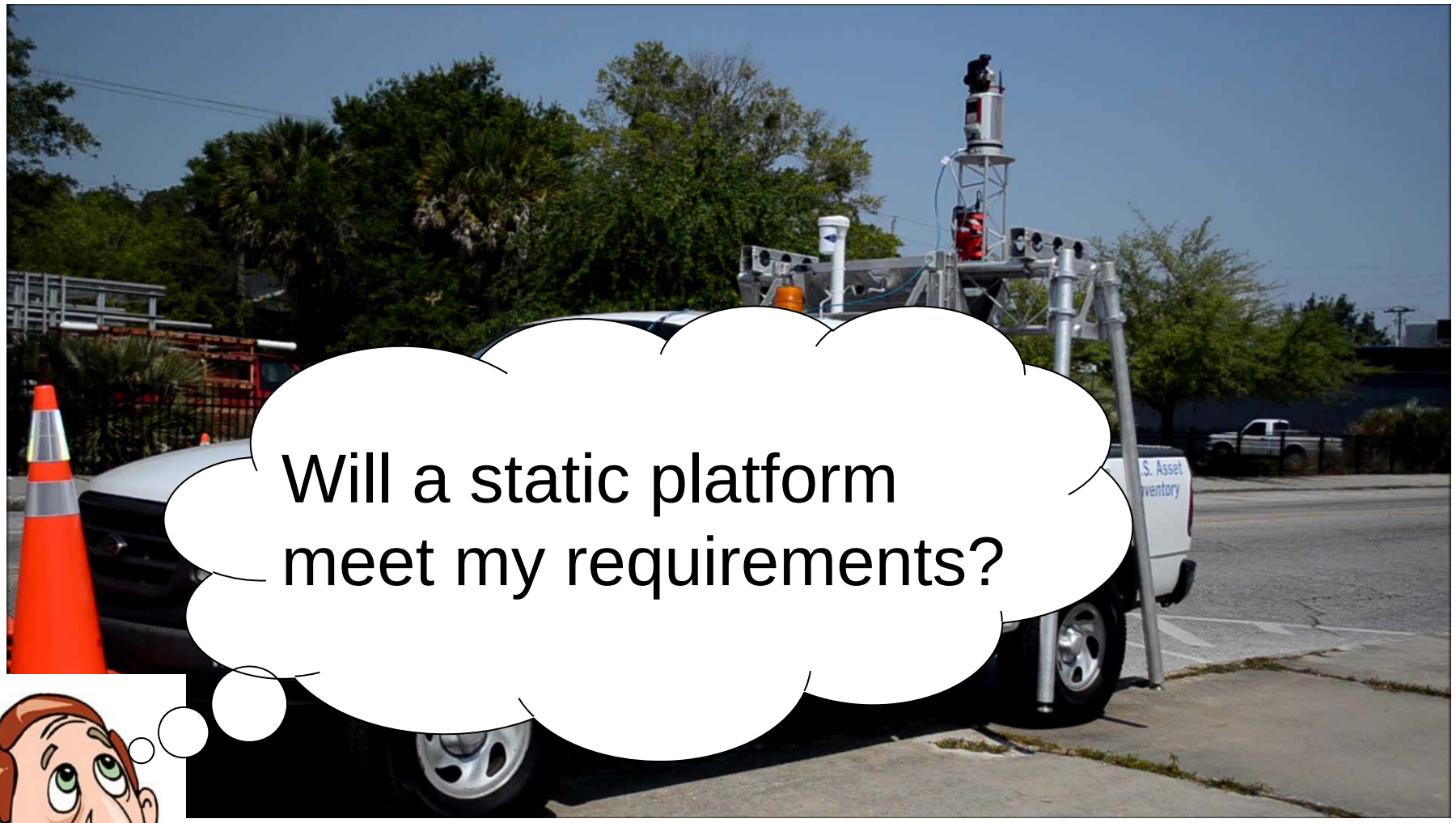
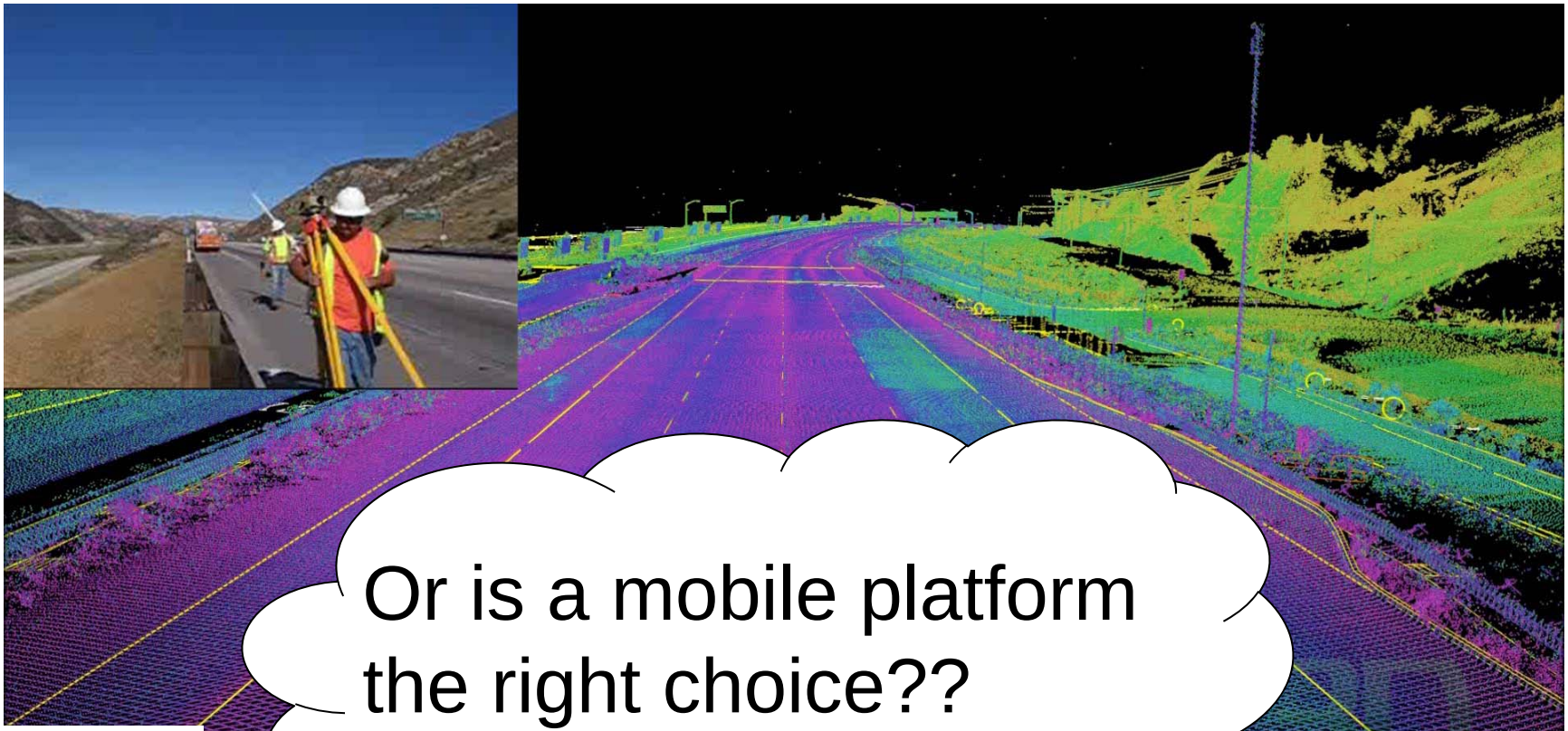
Meet Bob!!

Bob wants to use LiDAR for an FDOT project

But he has a lot of questions. . .



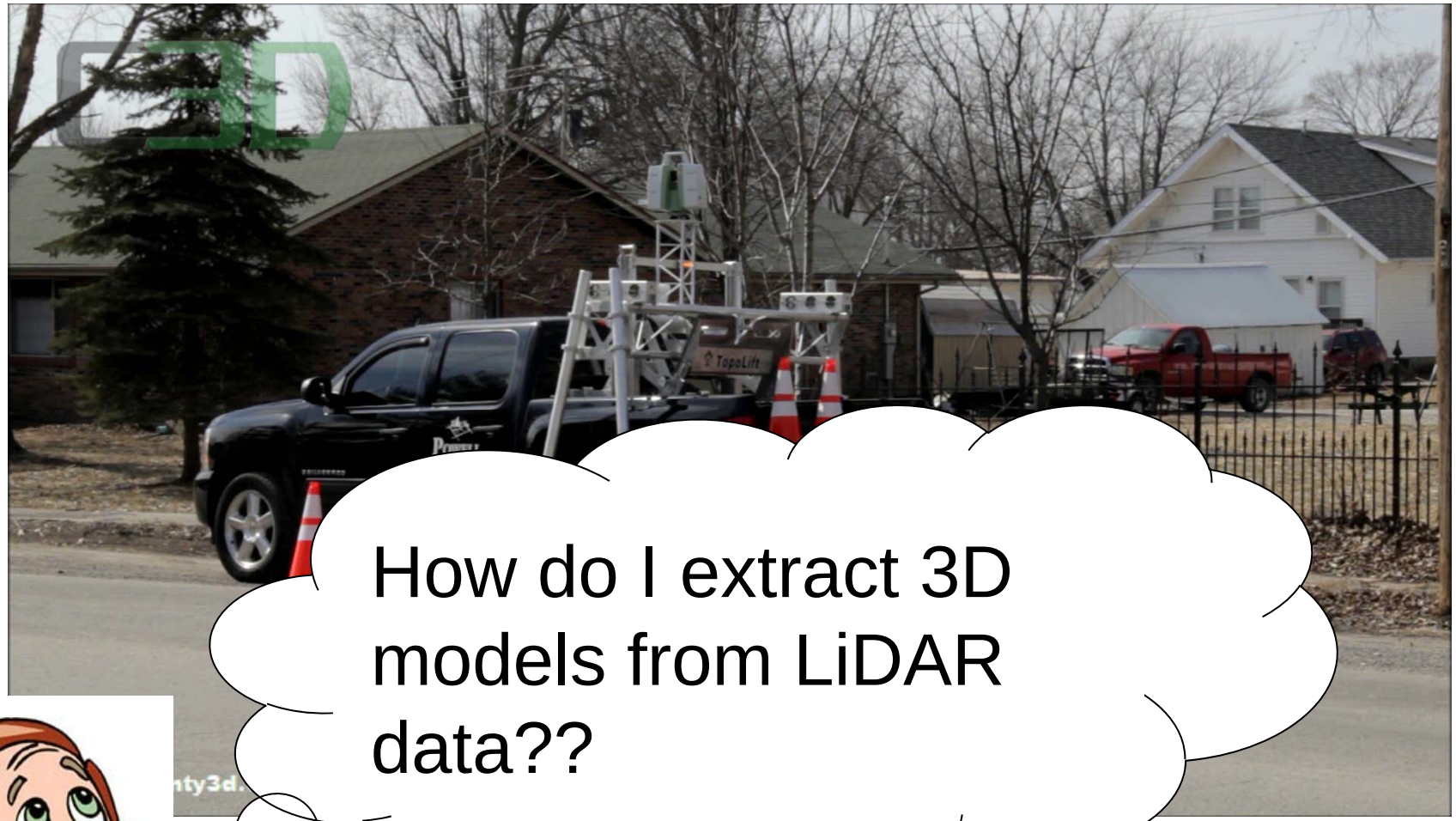

Will a static platform
meet my requirements?



Or is a mobile platform the right choice??


How do I manage all this data??

How do I assess data quality?


How do I extract 3D models from LiDAR data??

FDOT has the solution for Bob. . .

Requirements??

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Project Planning??

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Data Management??

TopoCloud™

QA/QC & Modeling??

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Establishing Requirements

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TechNote #1021

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For: General Release

From: Ted Knaak
Certainty 3D, LLC

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Establishing Requirements, Extracting Metrics & Evaluating Quality of LiDAR Data

Abstract

This document presents a concise, efficient and intuitive process for establishing LiDAR project data requirements, incorporating them into a request for proposal (RFP) and assessing the data against those requirements. An overview of LiDAR technology and data uncertainty provides insight into the reasoning behind point cloud and calibrated image data requirements. Suggested text for applying these requirements within the context of a request for proposal (RFP) is given. Methods for assessing the spatial orientation of the data yield a well-documented lineage from the data to network survey control coordinates. Additional methods are presented to assess the fundamental characteristics of point clouds and calibrated images assuring extracted features, measurements and models will meet project requirements. Examples employing TopoDOT® software tools demonstrate the execution of each process. The examples contained herein are predominately for civil infrastructure applications although the methods may be broadly applied in other areas.

Complete LiDAR Data Requirements

Green		Static LiDAR Data
Scan alignment	Es=0.03 feet (9mm) P=4% of total scans R=80 feet	"Scan Alignment RFP Requirement (static)"
Survey control alignment	Ec=0.02 feet (6mm) (N/Es=0.03 feet (9mm)) P=4% of total scans r=0.5 feet (30mm)	"Survey Control Alignment RFP Requirement (static Topography)"
Calibrated Image alignment	Px = 2 pixels WxH = 12.1 megapixels	"Calibrated Image RFP Requirement"
Random noise		dom Noise RFP Requirement"
Point density		d Density RFP Requirement

Just 12 Parameters to establish project data requirements!! Cool!!

Project Planning

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Estimate layout, schedule and price!!

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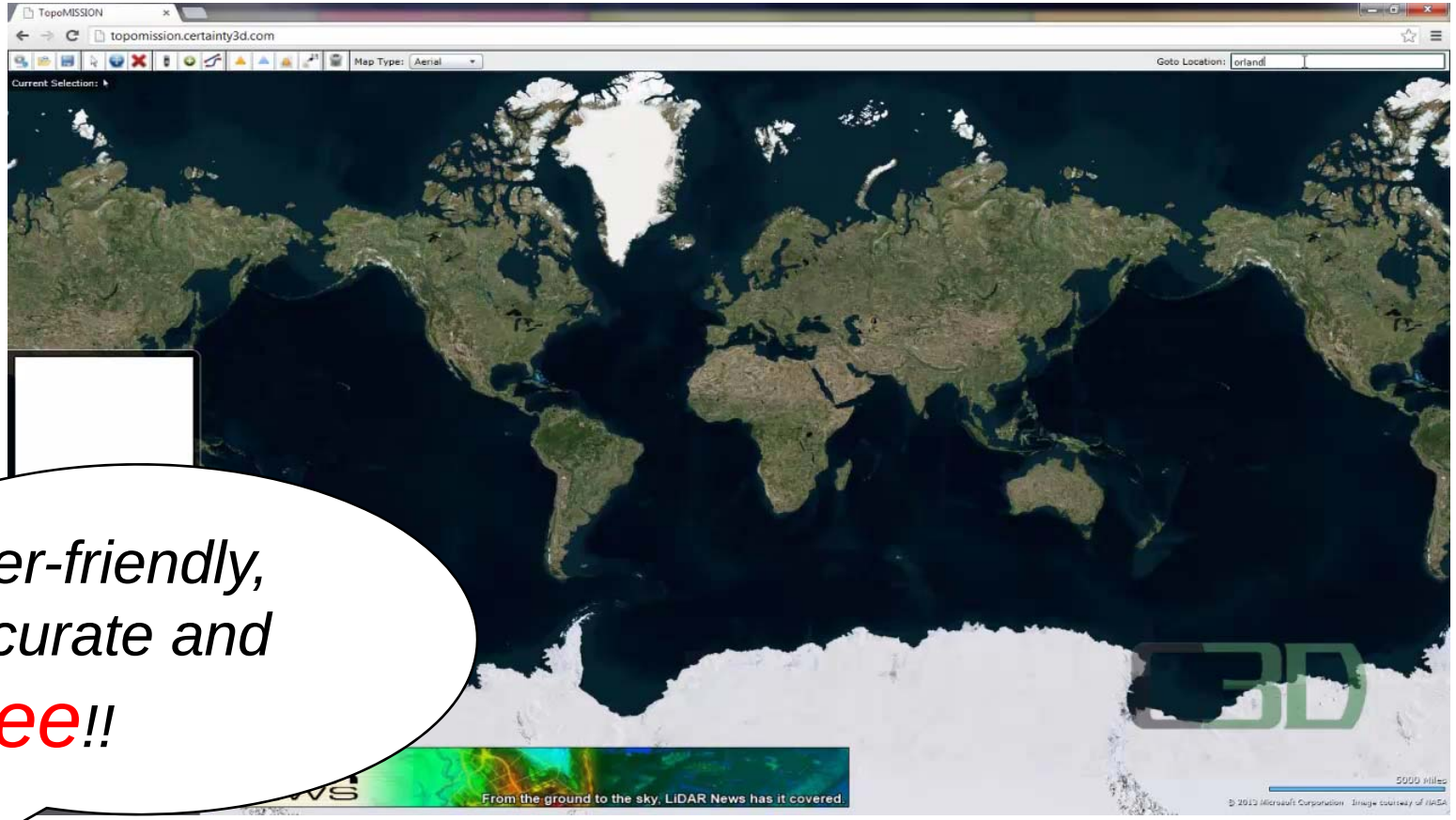

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Data Management

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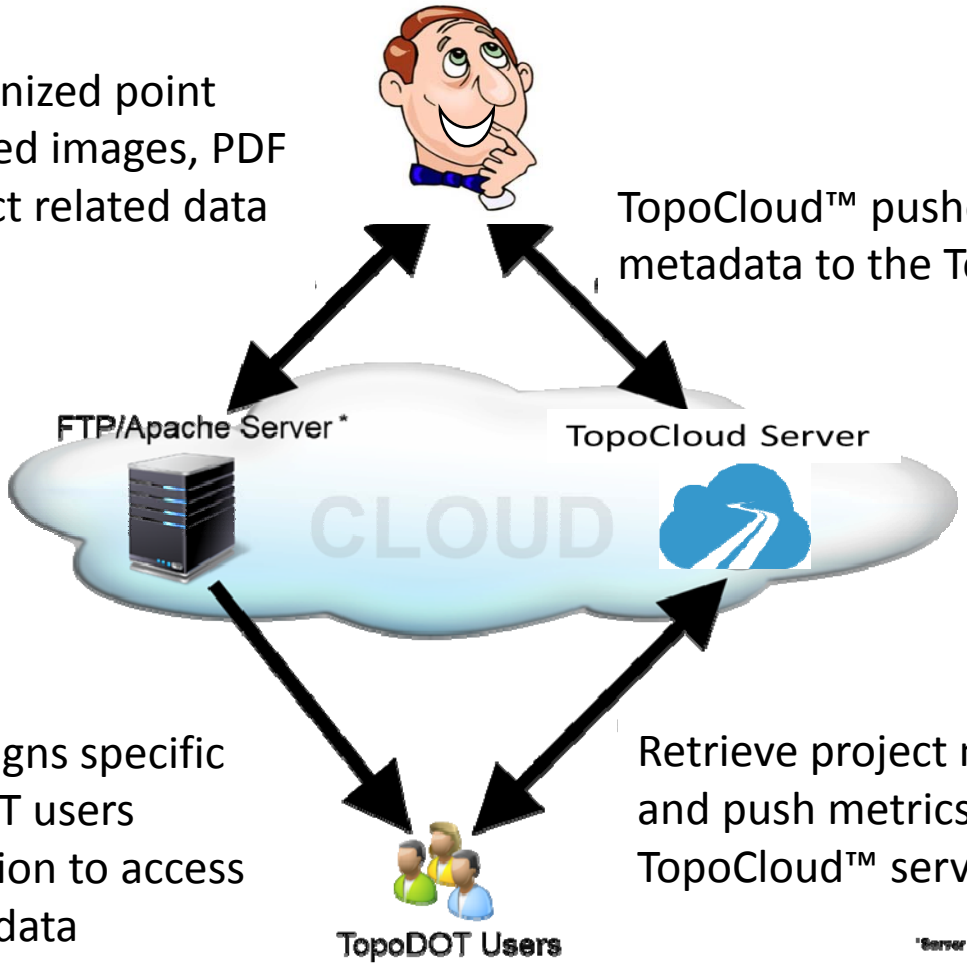
Bob stores organized point clouds, calibrated images, PDF files, and project related data to his server



TopoCloud™ pushes project metadata to the TopoCloud™ server

Bob assigns specific TopoDOT users permission to access project data

Retrieve project metadata and push metrics to TopoCloud™ server

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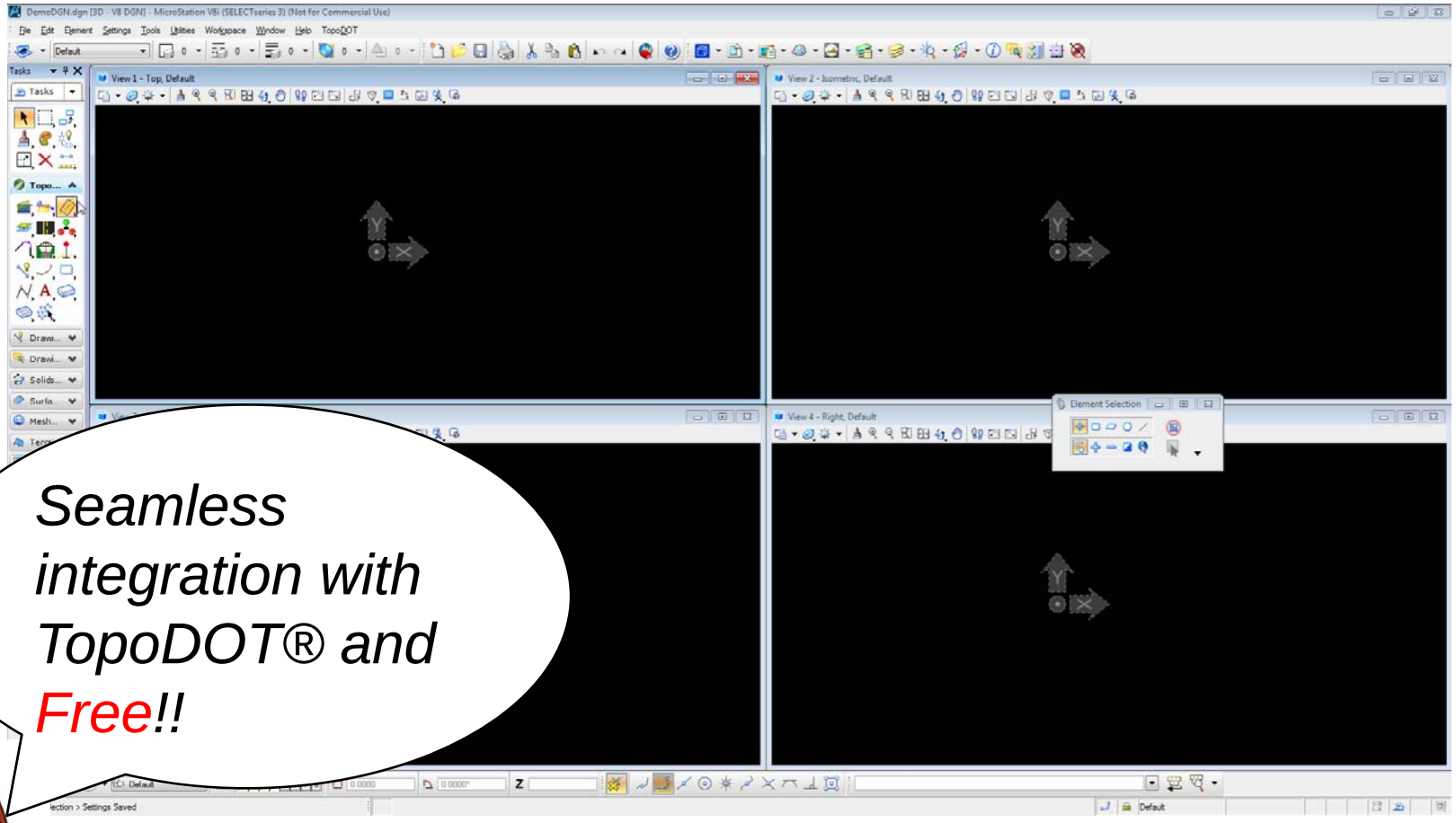

QA/QC

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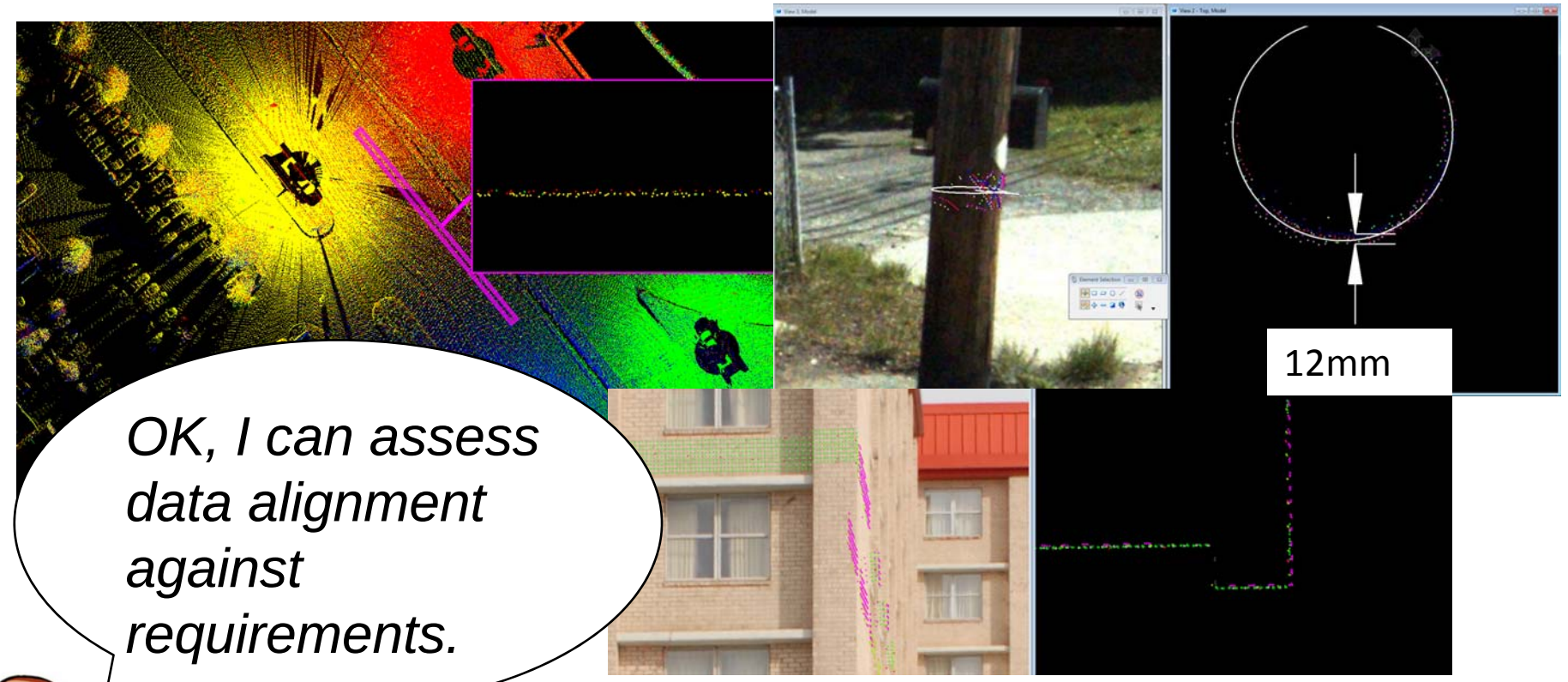
Quality of Static Scan Data alignment



OK, I can assess data alignment against requirements.

Horizontal Alignment

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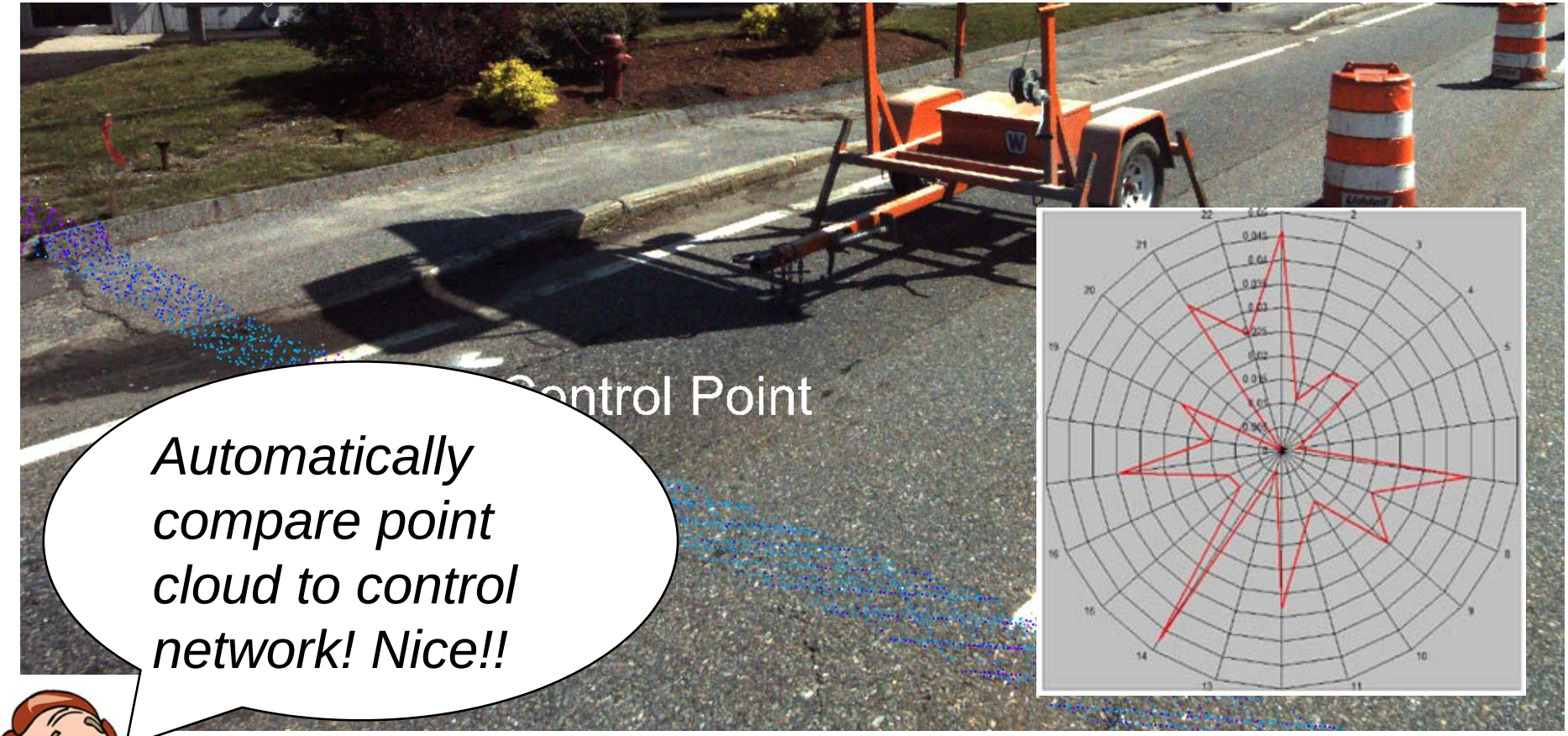
Quality of Point Cloud to Control Alignment



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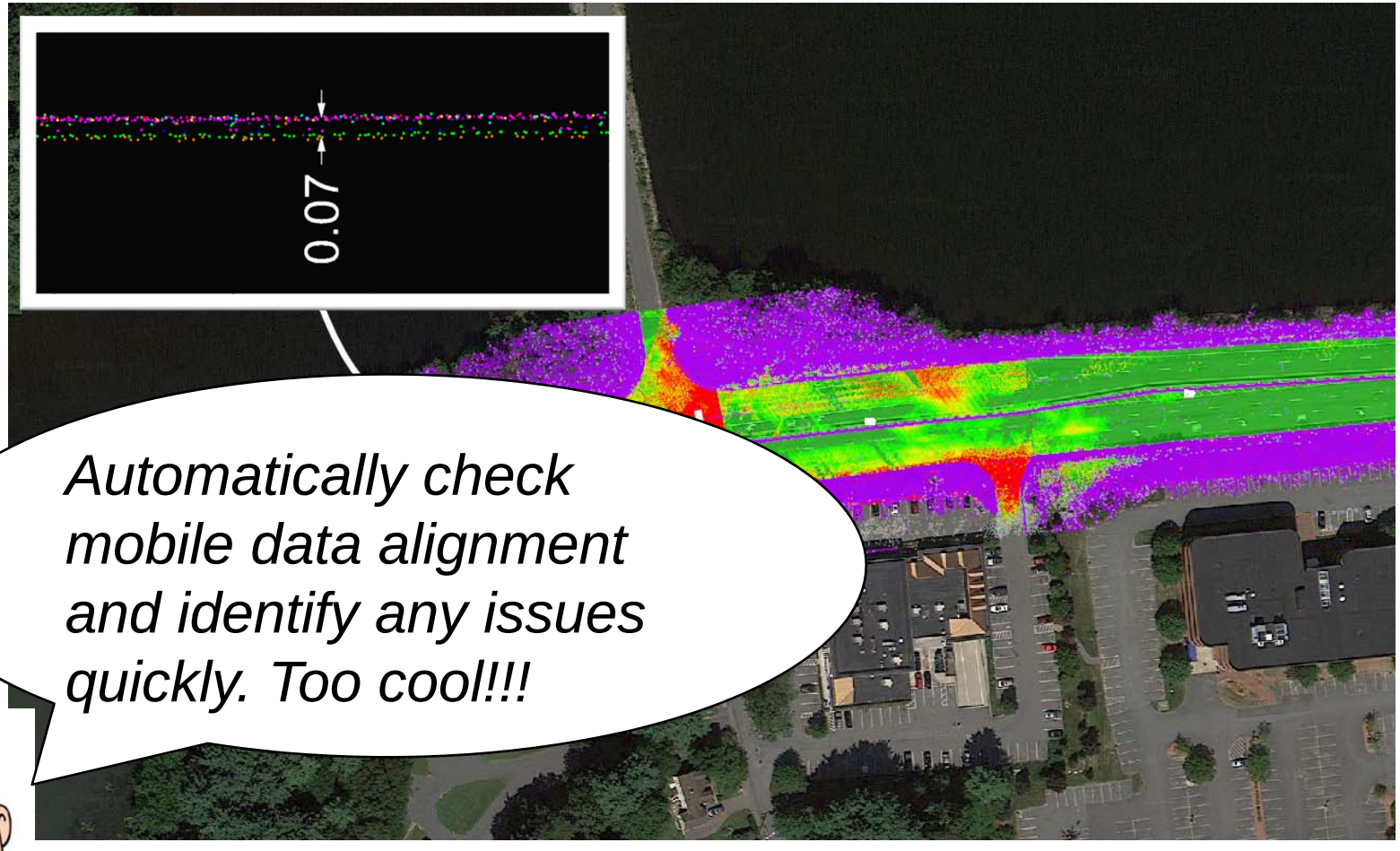
Quality of Flight Line Alignment



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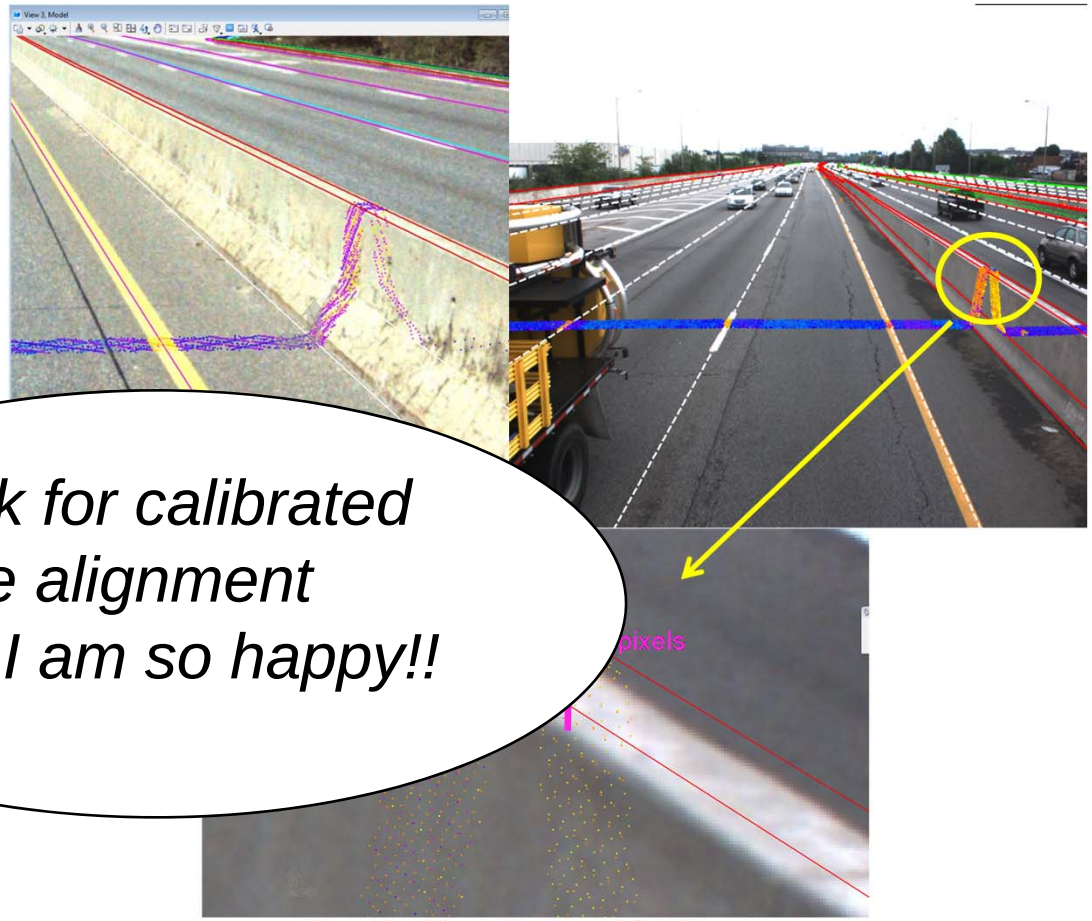
Quality of Image Alignment



Aligned (Left) and Misaligned (Right) Images

Check for calibrated image alignment too!!! I am so happy!!

Model Extraction

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Extract high quality models

Import images, point cloud and extract a high quality model!! Wow! Show me some details!

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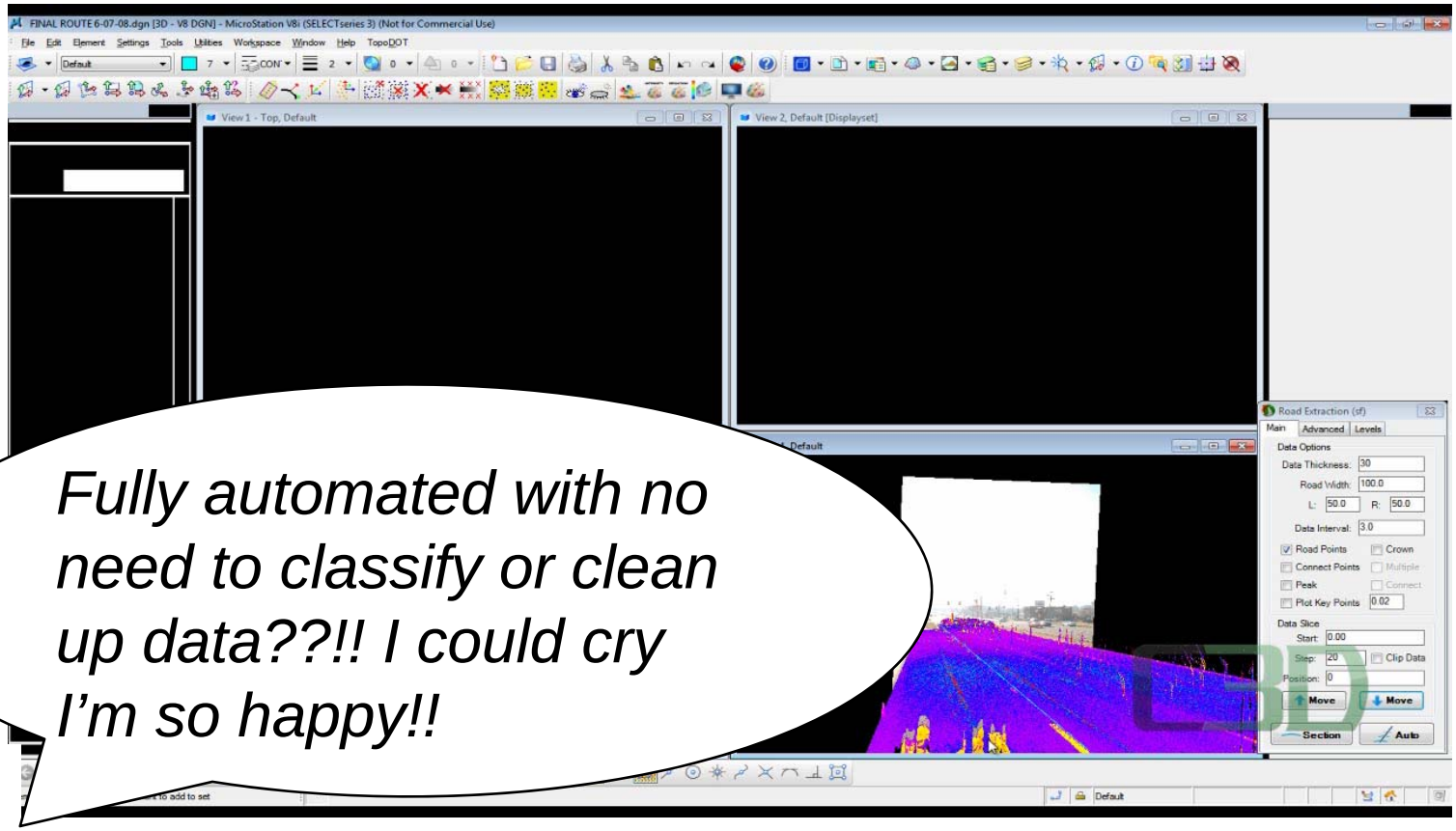
Road surface extraction



Fully automated with no need to classify or clean up data??!! I could cry I'm so happy!!

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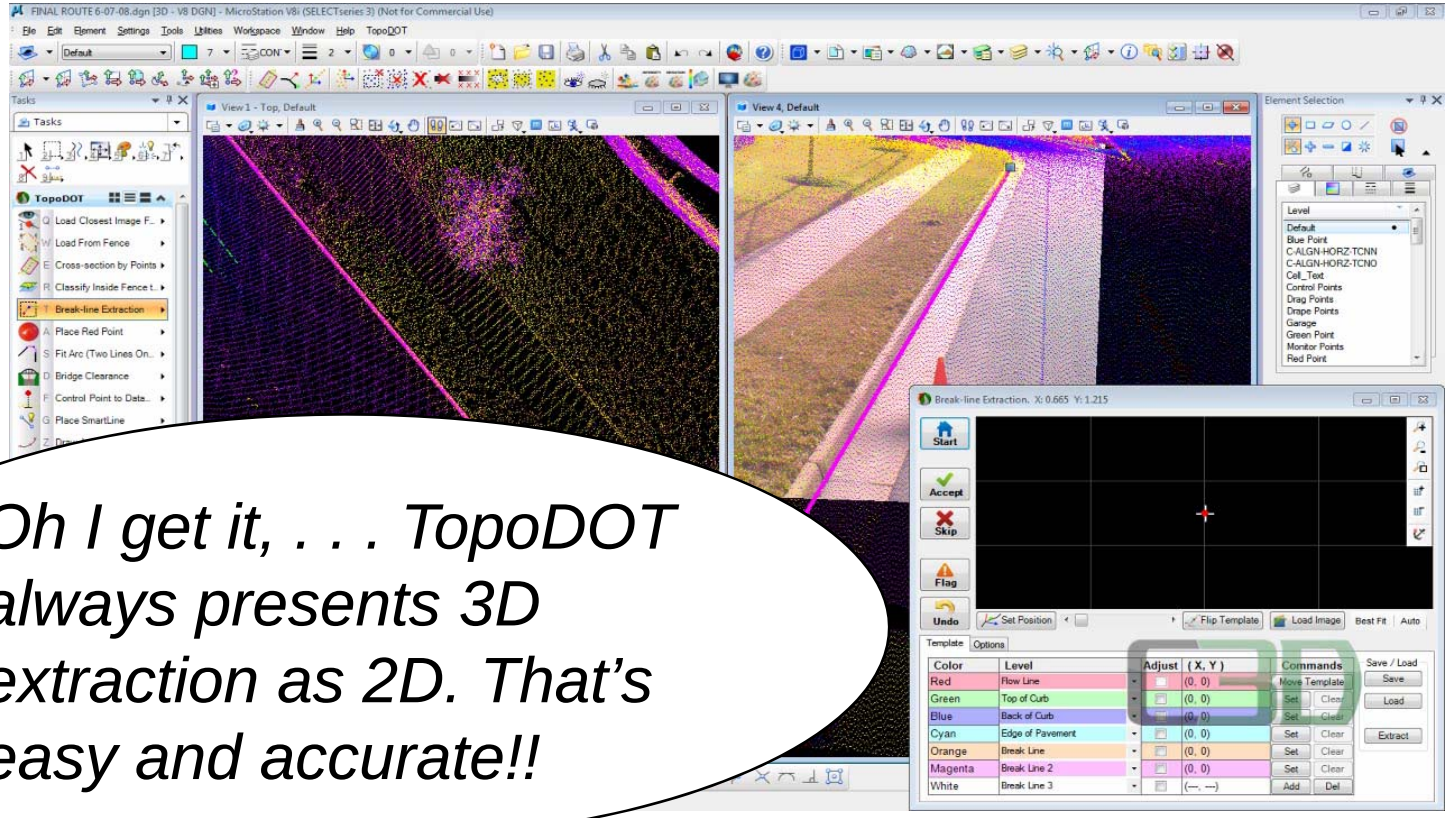
Break Line Extraction



Oh I get it, . . . TopoDOT always presents 3D extraction as 2D. That's easy and accurate!!

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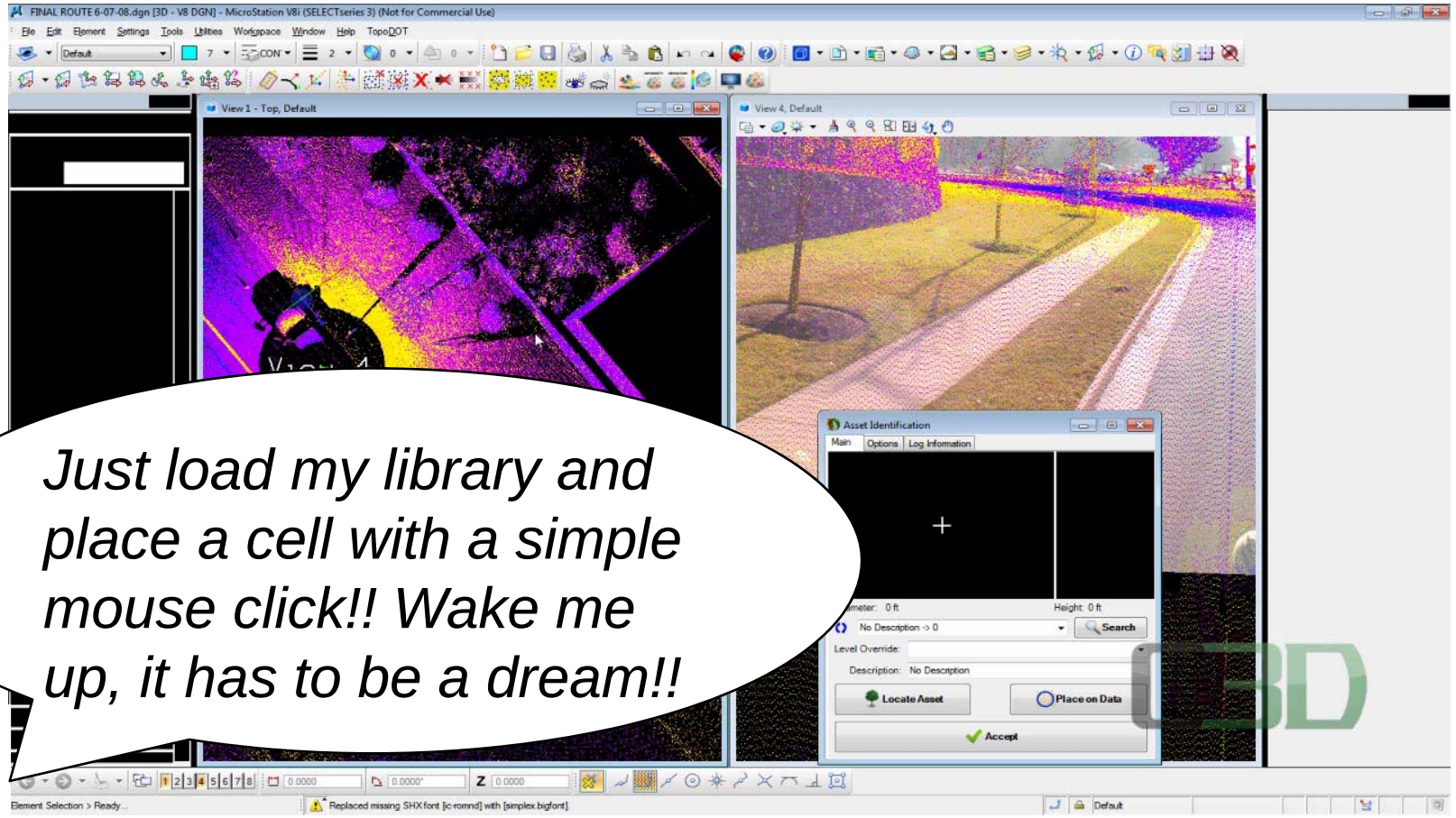
Feature Extract and Cell Placement



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Thank you!! Any questions??

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