
PRELIMINARY HYDRAULIC SURVEY

MODULE 5 - KEVIN CARLASCIO, LSIT

Kevin Carlascio, LSIT



**Survey Supervisor
South Central Region, Project Development
WSDOT**



Current duties: Oversee and manage region survey needs, coordinate and support fish passage survey deliverables.

Background & Experience: During the past 14 years at the WSDOT Kevin has worked in design, construction, Computer Aided Engineering and survey. Kevin has applied his background in emerging technologies to traditional highway infrastructure projects, emergency needs and state wide fish passage projects. Kevin has three years of experience in surveying and land development in the private sector, and 10 years in customer service. In June of this year, Kevin completed his 12th year as a adjunct instructor at Yakima Valley College, YVC. Under Kevin's direction, YVC began a Land Survey and Construction design program and will graduate it's first students this spring.

Education: YVC, June 2005, AS in Civil Engineering Technology

Personal interests: Kevin, his bride Stacy, and their 4 children live in Yakima. They love family time and relaxing by their pool in the Yakima heat.

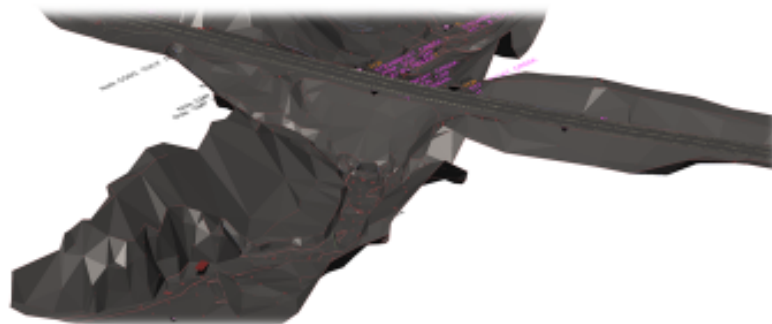
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Kevin Carlascio, LSIT



Preliminary Hydraulic Survey

This presentation will define the roles and expectations of the parties involved, challenges associated with data collection, the timeline of deliverables, and a general overview of WSDOT's role in the surveying process.



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PRELIMINARY SURVEY COLLECTION

Kevin Carlascio, LSIT - Survey Supervisor

WSDOT South Central Region, Union Gap

Project Development Survey & Computer Aided Engineer (CAE)



Vision

Perseverance and allegiance to the law, land, customers and Washington travelers.

Seek, build and harbor team comradery. Encourage an innovative working environment with a foundation of trust, transparency and accountability. Reward dedication and hard work with recognition and peace.

Mission

Foster a culture of growing and developing talent, encourage and raise all who seek knowledge.

For if we pass our knowledge to the ones who share our vision our profession will live on and benefit generations to come.



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What do we at WSDOT Survey?



Establish Geodetic Control

Proprietary project control

Secondary project control

Route monuments for R/W

Cadastral ties & R/W



3

What do we at WSDOT Survey?**Workforce development**

- Equipment procurement
- Develop procedures
- Conduct training
- Support and troubleshoot



4

What do we at WSDOT Survey?**Location Survey**

- Emergency
- Construction
- Concept layout
- Route



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What do we at WSDOT Survey?

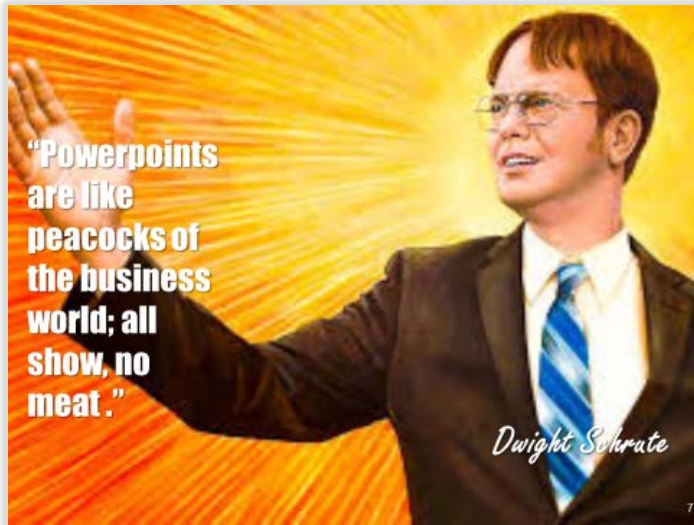
SR 101 Elwha River

**Specialty Survey**

- Slope monitoring
- Hydraulic
- Bathymetric
- Aerial



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**What will you gain by listening to this presentation?**

General understanding of what we do and the product we provide

Challenges and delays

Timelines and deliverables

Goals and expectations

Our model to deliver the product to the customer

Common asked questions from our customers

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PRELIMINARY SURVEY DATA,

Is NOT NECESSARY!

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IT JUST TAKES

TOO LONG TO GET THE DATA!

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WE NEVER GET

CONSISTANT DELIVERABLES!

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IT IS JUST WAY TO



EXPENSIVE!

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LET'S JUST

USE LIDAR DATA!

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**"The trouble
with the
world is not
that people
know too
little; it's that
they know so
many things
that just
aren't so."**

Mark Twain

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WELL, WHAT IS SO.

**CHEAP
CANNED
QUICK**

NEVER A RECIPE FOR SUCCESS

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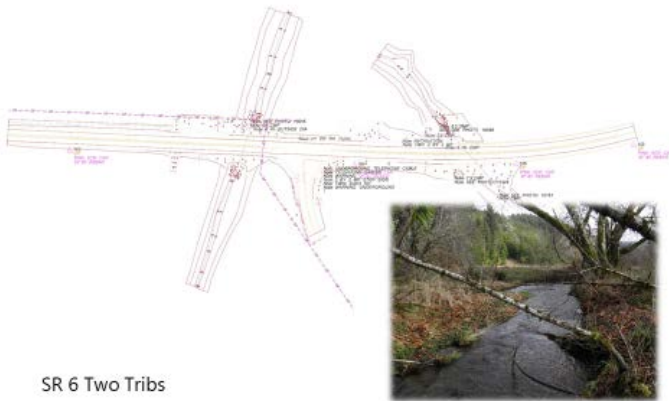
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2013 three pilot Fish Passage Project for North Central Region

SR 6 Salmon Creek

WSDOT

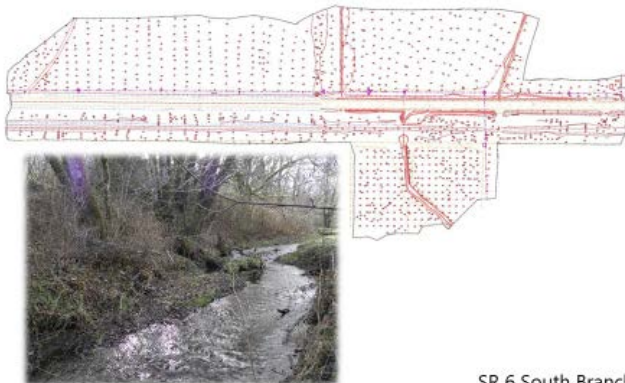
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2013 three pilot Fish Passage Project for North Central Region

SR 6 Two Tribes

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2013 three pilot Fish Passage Project for North Central Region

SR 6 South Branch

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2013 three pilot Fish Passage Project for North Central Region

Realized the magnitude of the program

Wanted to be involved in more Fish Passage projects

Lots of lessons learned

Many ways to deliver a better product



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QUESTION?

What do these companies have in common?



P X A R
ANIMATION STUDIOS

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ANSWER

CONSISTANCEY



P X A R
ANIMATION STUDIOS

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How can we improve the next round of Fish Passage?

Talk to our customers

Analyze our process

Develop new procedures

Train our workforce

Be open to change



Be Consistent!

How can we be more consistent?

1. Each project location has been prioritized and grouped accordingly.
2. One Survey Supervisor overseeing dates and deliverables.
3. Brake the entire Survey process up into phases.

Phase 1 – Establish Control

Phase 2 – Topography Collection

Phase 3 – Return for full Topography for

Final Hydraulic Design (FHD) or Plans, Specials & Estimate (PSE)

**PHASE 1 – Establish Control**

WSDOT HQ Survey and Mapping Section



PHASE 1 – Establish Control

WSDOT HQ Survey and Mapping Section

Geometric Survey Office

Survey Monument Database

The database is a set of utilities and attributes as referenced to individual geographic locations, hereafter referred to as "Point". Each individual Point has a location relative to all other points in the database as referenced to a coordinate grid. The relative location of the points as represented in this database correspond to the physical or determined locations of Survey Control Monuments.

Attribute values of each point may contain accurate data, physical descriptions on the monuments, descriptions for reinforcement and recovery, horizontal and vertical reference datum's, dates of recovery, determination, origin of data values, and methods used for value determination.

Feedback and data questions should be sent to: assessments@wsdot.wa.gov

For information on a specific Monument or area check the [CAPSIS 6808](#)

Survey Related Documents

- Monument Mapping Analysis User Guide, v3.0, [pdf available](#) (Adobe PDF File)
- Aerial Map Link at Construction Point Based 2009 Construction Point Link to 2008 Survey Points (Adobe PDF File)

Other Monument sites

- [NCE Data Sheet on State and Department](#)
- [NCE Data Sheet on Area](#)
- [NCE Data Sheet on FSD](#)

Links

- [NCE Data Sheet on State and Department](#)
- [NCE Data Sheet on Area](#)
- [NCE Data Sheet on FSD](#)

Search

Find monuments on a Geographic Map

Specific Search (Monument ID, Geographic, City/Town, County, Project Number)

Broad Search (Data, Road, County, Region, Monuments, and State Plane)

Category (Township, Range, Section, and/or Corner Code)

Area Search (Quadrangle, Township, and/or Data)

Search and Download Monument Data

Search and Download Monument History Data

Links

- [Geometric Survey](#)
- [Right of Way Plans](#)

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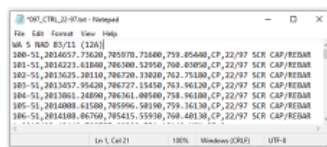
PHASE 1 – Establish Control

Everyone works in WA State Plane coordinate system

North zone (4601)

South zone (4602)

Data sheet provided for each project



Geographic Services

SURVEY INFORMATION SYSTEM Report of Survey Mark

Designation	Monument ID	Point ID	Name	County	Region	Monument Type
100-51, 2014037, 73620, 70070, 70000, 70000, CP, 22/97 SCR CAP/REBAR						

Survey Mark Data	Monument Data
100-51, 2014037, 73620, 70070, 70000, 70000, CP, 22/97 SCR CAP/REBAR	100-51, 2014037, 73620, 70070, 70000, 70000, CP, 22/97 SCR CAP/REBAR

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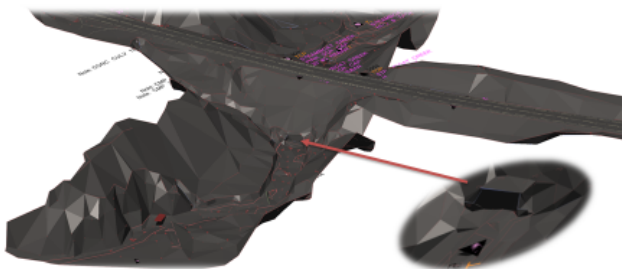
PHASE 2 – Topographic Collection

Identify critical features

Plan for the next steps

Define limits

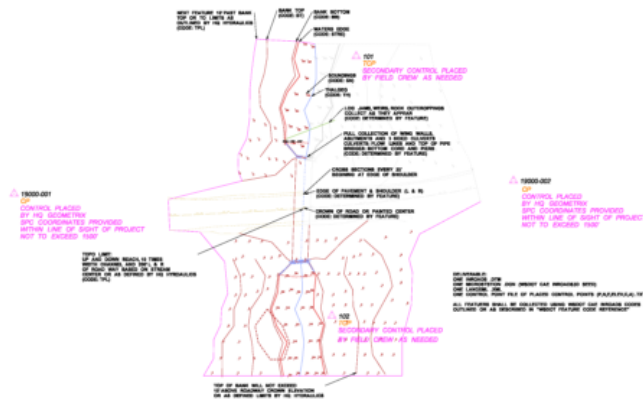
Schedule collection team



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PHASE 2 – Topographic Collection



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PHASE 2 – Topographic Collection

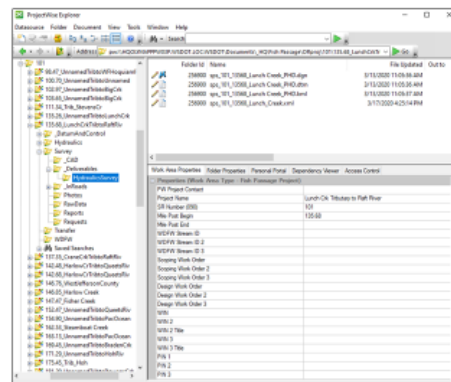
HQ CAE – Clint Hill and team

Central Project repository

File locations

File names

PHASE 3 preparation



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PHASE 3 – Establish Project Datum Control & Full Design



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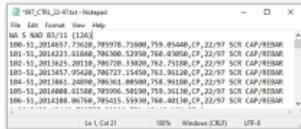
PHASE 3 – Establish Project Datum Control & Full Design



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PHASE 3 – Establish Project Datum Control & Full Design

WA State Plane coordinate system



Calculate and transform as
Projects are scheduled and FHD
grouped

WSDOT Project Datum

Area Name	SIP - 2017-2019, South									
Area	County									
Area	City									
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Area	West									
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Customer Questions & how we made improvements

Where is my data?

Why does this take so long?

Why is this so expensive?

Why can't we just use LiDAR?

Why does the control not match?



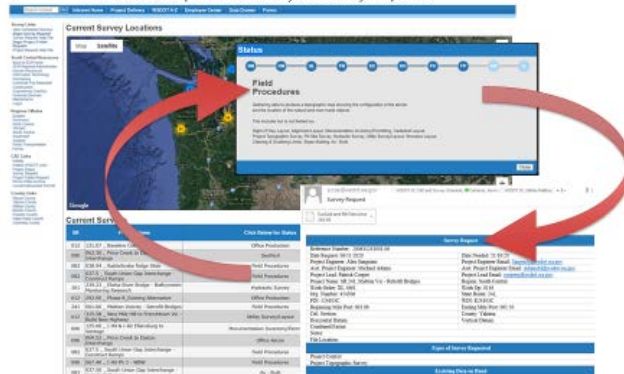
SR 101 Elwha River



3E

Where is my data?

For WSDOT employees, we developed a web-based interface to request and track your Survey requests.



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Why does it take so long?

Identify the location classification

Chronic Environmental Deficiency, CED

Preliminary Hydraulic Design, PHD

Final Hydraulic Design, FHD

Plans, Specials & Estimate, PSE



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Why does it take so long?

Identify and include specialty groups

Real Estate Services

Utilities

Traffic

Maintenance

Environmental

Program Management

Existing Data



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WHY DOES IT TAKE SO LONG?**Project conditions**

Heavy brush or urban

Logistics

Water hazards

Resources

Team

Equipment

Lodging

Why does it take so long?**Change management**

Scope change

Shed/ved project

Funding restriction

Post Process

Quality verification

Final assembly

Data delivery and follow up

**Why is it so expensive?****Unplanned and Return trips**

Errors in data

Missing data

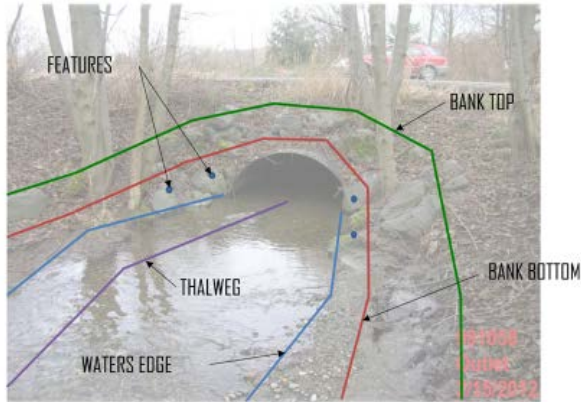
Unclear Scope of Work

Poor communication

Unclear expectations

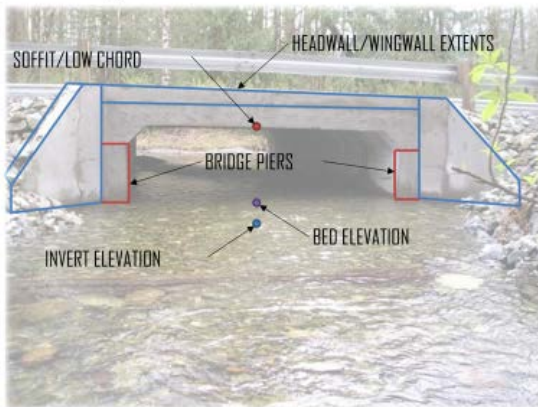
Undefined goals



Why can't we just use LiDAR?

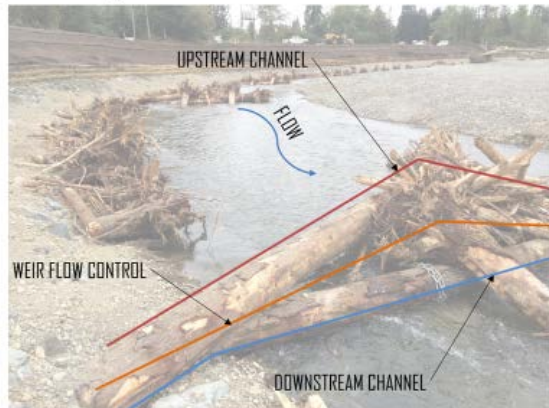
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Why can't we just use LiDAR?

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Why can't we just use LiDAR?

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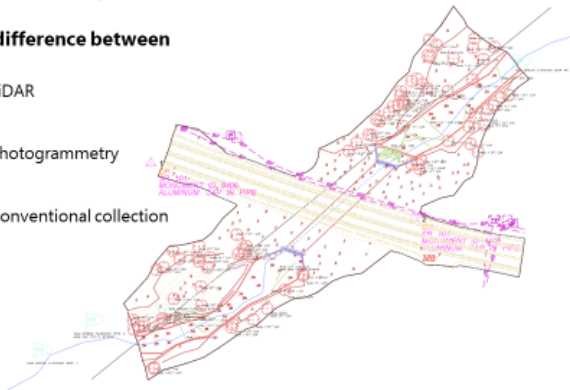
Why can't we just use LiDAR?

The difference between

LiDAR

Photogrammetry

Conventional collection



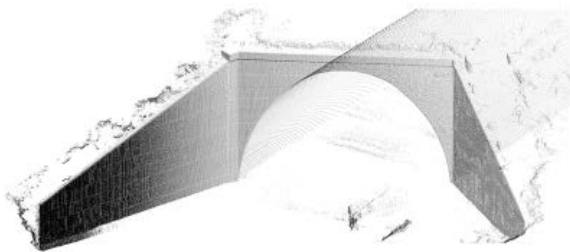
SR 101 Indian Creek

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Why can't we just use LiDAR?

LIDAR, Light Detection and Ranging, is a remote sensing method that uses light in the form of a pulsed laser to measure ranges to the Earth.



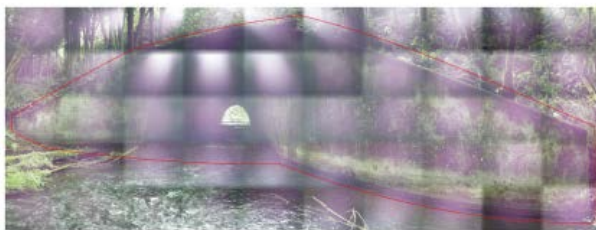
Terrestrial scanner (Leica MS60)

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Why can't we just use LiDAR?

Photogrammetry is the science of making measurements from photographs. The input to photogrammetry is photographs, and the output is typically a map, a drawing, a measurement, or a 3D model of some real-world object or scene.



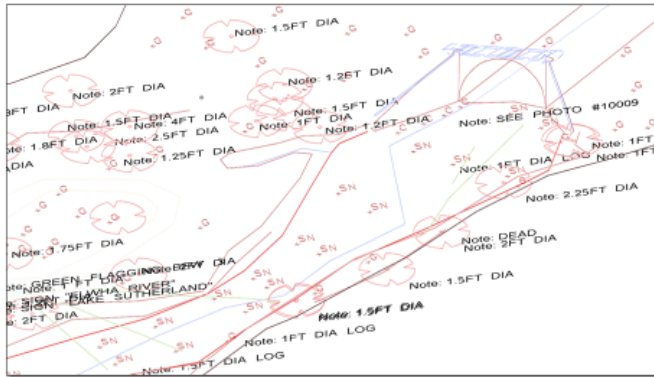
Terrestrial scanner (Leica MS60)

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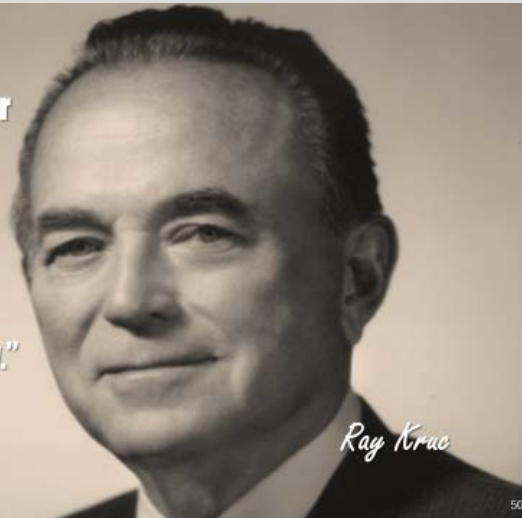
Why can't we just use LiDAR?

Together, we combined all methods for a complete project



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"Whatever we are doing today, we can do better tomorrow."



Ray Kruc

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PRELIMINARY SURVEY DATA,

IS NECESSARY!

Plan

Organize

Communicate

Collect

Deliver



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