Roading from an Aerial Perspective

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Content

1. Introduction
2. Aerial Imagery
3. Software
4. Mapping (Orthomosaics)
5. Survey (3d Point Clouds)
6. Safety
7. Community Engagement
8. Limitations and Restrictions
Southland District is the second largest TLA in NZ by road km’s (second only to the now amalgamated Auckland Super City)

- 3,000km unsealed roads
- 2,000km sealed roads
- 1,200+ road related structures

Southland District covers approx. 13% of NZ land mass

- Geographically it varies greatly
- Challenging (erosion, slips, heavy traffic demand)
- 30,000 residents
Types of drone’s available and what SDC currently use:

- **< $1,000**
  - Toy Range
- **$2,000 - $3,500**
  - Mid Range Consumer
- **$5,000 - $10,000**
  - High End Consumer
- **$10,000 +**
  - Commercial

You don’t need to spend a lot to see the benefits
2. Aerial Imagery

Examples:

- Slip monitoring
- Bridge/structures
- Erosion monitoring
- Construction management
- Consent monitoring
- Quarry management
- Vegetation Management

Colac Foreshore Road Erosion Monitoring
2. Aerial Imagery

Examples:

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Lower Hollyford Slip Event
2. Aerial Imagery

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Mataura River in Flood
2. Aerial Imagery

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Noxious Plant Control
2. Aerial Imagery

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Construction Management
3. Software

Technical Outputs from Simple Images

How it works...

Raw Data → Processing Software → Outputs

PIX4D

DroneDeploy

Image of technical outputs.

Cosy Nook – Coastal Protection Works

*Cosy Nook – Coastal Protection Works*

Cosy Nook – Coastal Protection Works

Issues:

- Remote location
- Existing maps very poor quality
- Difficult site to inspect by foot
- Dangerous site to inspect
- Need a non-intrusive method within a sensitive coastal area

Stewart Island – Coastal Erosion

Stewart Island – Coastal Erosion

South Catlins – Alternative Coastal Route Project

Not limited to small scale mapping - map overlay shown is over 5km in length
5. Survey (3D Point Clouds)

Point cloud → Autodesk Civil 3D → Create surface and sections with endless design potential

Overview of surface + point cloud

C3D Surface created
5. Survey (3D Point Clouds)

Brydone Glencoe Road – Slip Investigation
5. Survey (3D Point Clouds)

- Doesn’t look like big a problem, but its not going away
- Continually topped up, keeps slumping over number of years
- ADT of 120 (23% Heavies = 28/day)
- $1 Million + for full repair in current location
- Alternative options being considered
- One alternative required an exploratory survey

Brydone Glencoe Road – Slip Investigation
5. Survey (3D Point Clouds)
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- 1.5 hours on site, 5km length
- Orthomosaic and point cloud
- Loaded into CAD
- Non intrusive
- Exploratory design can be completed

Brydone Glencoe Road – Slip Investigation
5. Survey (3D Point Clouds)

Cosy Nook Coastal Protection Works
5. Survey (3D Point Clouds)

Comparing Point Clouds (surfaces) - October 2015 and July 2016

- Monitoring consent conditions
- Measure any detrimental effects caused by protection structure
- Rich virtual 3D environment for viewing and showing stakeholders

Cosy Nook Coastal Protection Works
5. Survey (3D Point Clouds)

A useful tool for stockpile measurement and quality assurance

- Accurate
- Considerable time and effort savings compared to traditional methods
- Repeatable and Cost effective
6. Safety

- Up to date imagery
- Improved imagery
- Quick results
- Easy to incorporate into design
7. Community Engagement

Gore and Southland District Councils to consult on bridge replacement

The Pyramid Bridge, which is to be replaced.

COUNCIL TAKES TO THE SKY AS PART OF ROADING WORK

The Southern District Council is commissioning a range of preliminary work in a bid to improve the region's road network. This includes a drone survey and the installation of road safety equipment.

The Southern District Council

Road closure at the Catlins

The Channon's Bridge, under repair due to damage from heavy rain. A drone survey and road safety equipment are being installed to improve the region's road network.

The Southern District Council

ALTERNATIVE COASTAL ROUTE UPDATE

An alternative coastal route is under consideration to improve road safety and connectivity in the region. Public consultation is underway to gather feedback on potential routes.

The Southern District Council
7. Community Engagement

A powerful tool for getting information to customers

Imagery offers a new perspective to the customer of issues happening on the roading network

Also the ability to capture video footage in high definition (up to 4k)

Images and footage can be circulated via:

- Social media (Facebook)
- SDC website
- Newspapers
- Council newsletters
- Council reports
7. Limitations and Restrictions
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**Limitations**

- **Weather**
  - Rain (generally no rain at all)
  - Wind (<20km/hr OK to fly)

- **No Fly Zones**
  - Controlled airspace, low flying zones etc (CAA NZ permit system can help you around this)
  - Private land (prior permission required)

**Restrictions**

CAA NZ rules always apply (penalties and fines if not followed)
Thank you

End of Presentation