

Sound Planning, Safe Roads

Gregg Reid - Civil Engineering

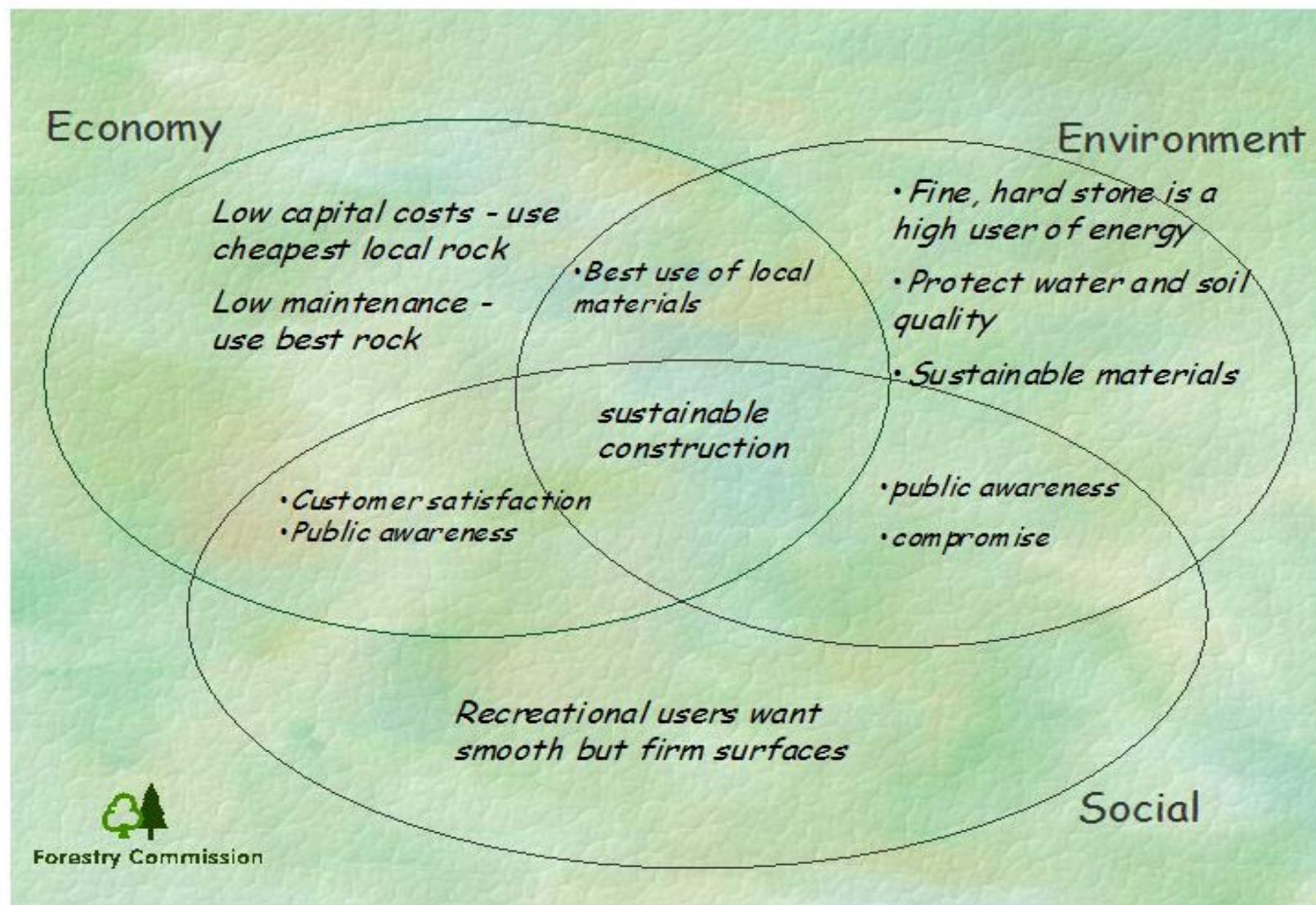
23 March, 2018

Introduction / Purpose

- The Forestry Commission (FC) Civil Engineering (FES) – *Forest Enterprise Scotland is an agency of the Forestry Commission managing Scotland's National Forest Estate*
- Forest roads are an integral and vital part of our forests
- The processes carried out to create safe, efficient, manageable road infrastructure.

Contents

1. Civil Engineering Asset Planning & Maintenance
2. Road Condition Survey
3. Extractives Sites
4. Example – Glen Orchy, West Argyll Forest District



Road Location & Design

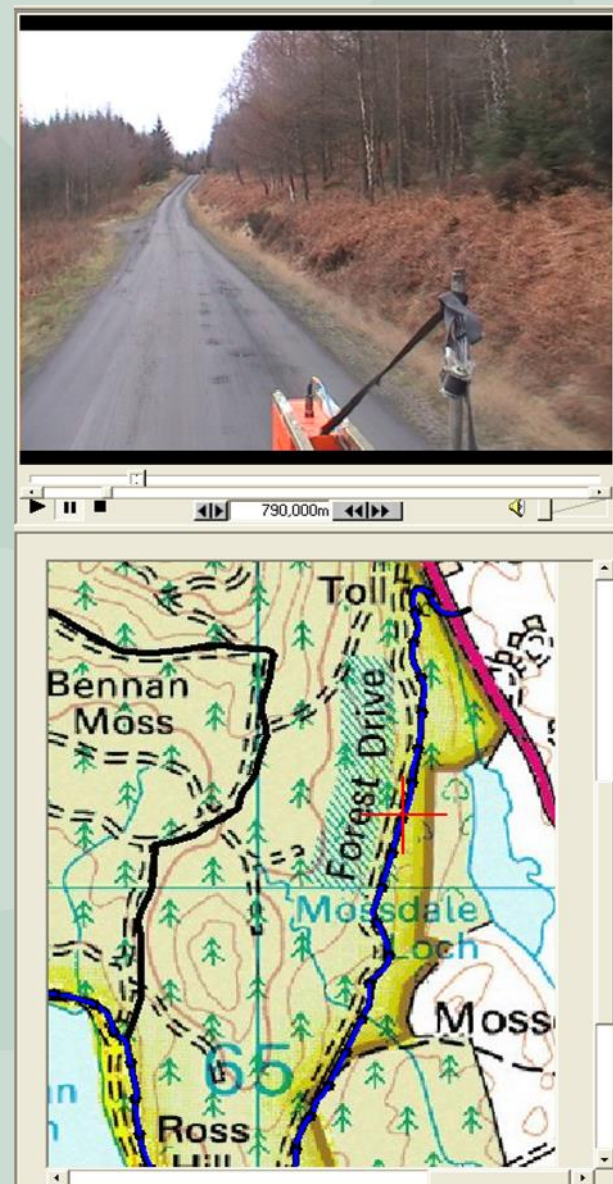
- There are a number of intertwined considerations that come into play - The art is finding the safest - most sustainable one
- In my opinion the most significant savings can be made at this stage. Get this wrong and future generations will be lumbered with this legacy

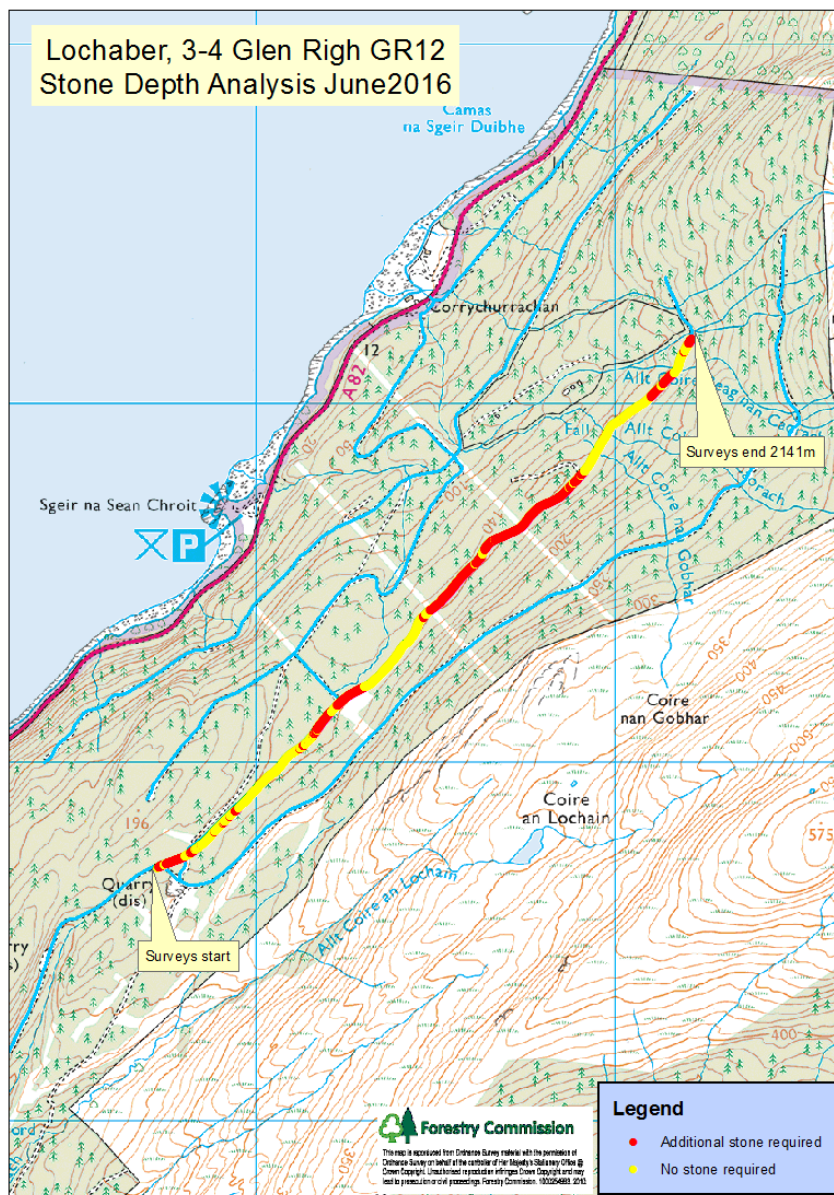


- Locate the forest road on the best ground, (thinner construction)
- Locate the road on sidelong ground, (lowest excavation costs to a stronger subgrade)
- Locate the road away from watercourses and unstable ground.
- Locate the alignment in relation to good watercourse crossing points
- Design a longitudinal profile with a minimum gradient of two percent (to prevent potholing and resulting high maintenance)
- Design a longitudinal profile with a maximum gradient of eight to ten percent to ensure grip and maintain traffic speed.
- Locate road close to potential sources of road materials to reduce stone haulage costs.
- Locate the road away from prominent positions from the landscaping point of view.
- Locate the road in wood to optimise stump to roadside costs,
- Locate the roads on the ground to facilitate bringing timber to the roadside
- Avoid SSSI's, public utilities and other restraints



2. Road Condition Survey





Distance(m)	Additional Compacted Depth (mm)	Area (m2)	Volume (m3)
0	600	2.1	
50	480	1.680	94.500
100	470	1.645	83.125
150	270	0.945	64.750
200	450	1.575	63.000
250	590	2.065	91.000
300	440	1.540	90.125
350	420	1.470	75.250
400	510	1.785	81.375
441	640	2.240	82.513
Total			725.638



Legislation

- Mines and Quarries Act 1954
- Mines and Quarries (Tips) Act 1969
- Mines and Quarries (Tips) Regulations 1971
- Management of Health and Safety at Work Regulations 1992
- Health and Safety at Work Act 1974 and raft of associated legislation

Legislation cont.

- Everyone connected with an extractives operation has a role under the Approved Code of Practice, Quarry Regulations 1999
- In actual fact, the QR's 1999, is more onerous than the HSWA 1974 because it defines roles and responsibilities

Appointments

- The person entitled to work the extractives site
- Operator
- Extractives Manager
- Explosives Supervisor
- Shotfirer
- Trainee Shotfirer
- Explosive Storekeeper
- Driller
- Explosives Handler
- Sentry







Succoth Quarry.MOD

Crushing Circus





50mm - dust



150mm aggregate size

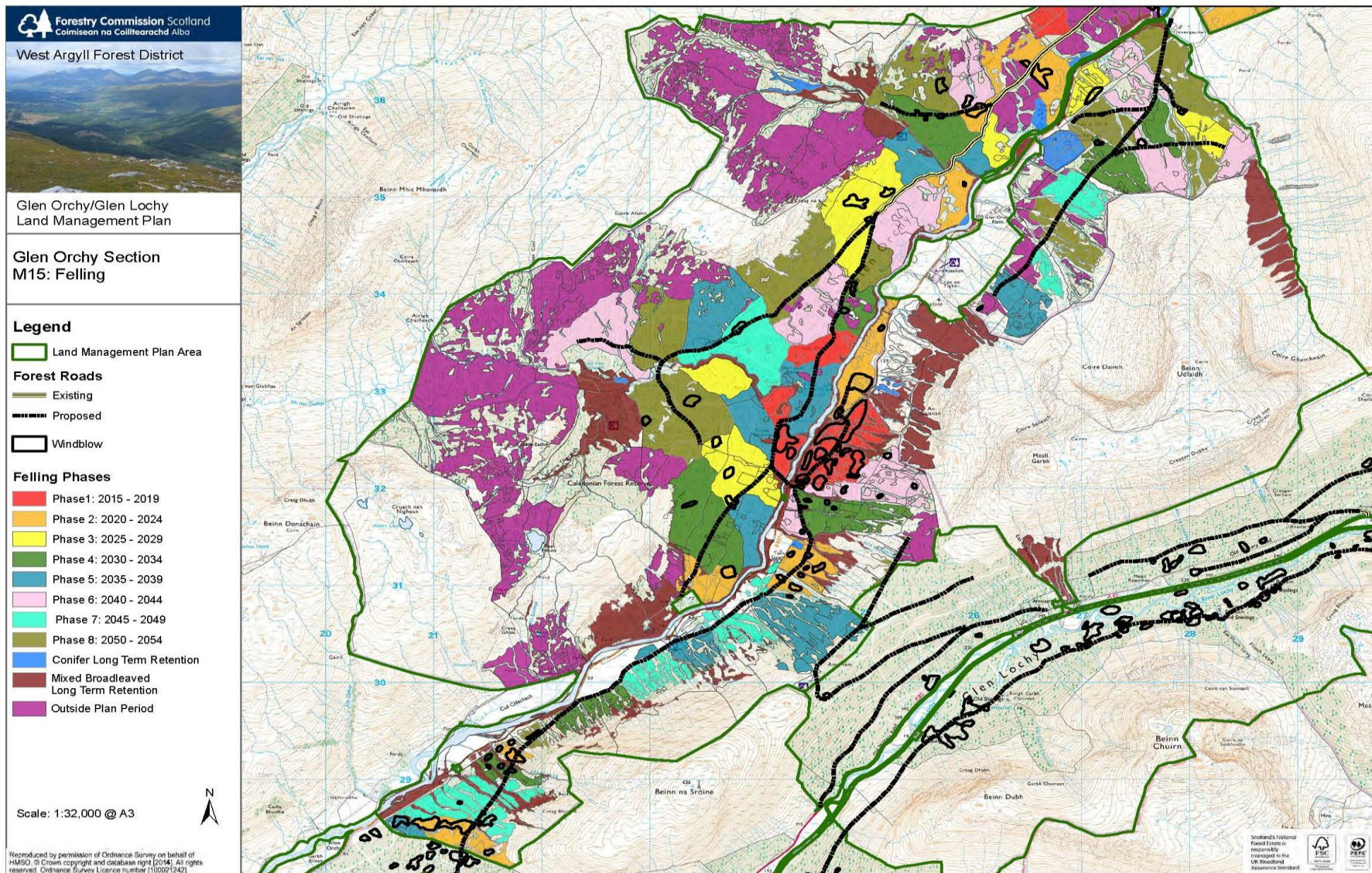
Background

- The Glen Lochy and Glen Orchy Land Management Plan area covers a triangle of land with its western corner at Dalmally on the A85
- Total area just under 10k hectares of predominantly commercial conifer planted in the 70/80's of which is ready for harvest
- Active LMP. 10 year forecast of 30k Ton of timber per annum
- Unlocking forest blocks for new opportunities

For example - Plant Health (Access) to protect Caledonian Pinewood from DNB (red band needle blight), and potential risk to *Phytophthora ramorum*

Objective

- Replace existing bridge over the Allt. Broighleachan watercourse for new 44 Ton road bridge (36.6m span)
- Project will eventually provide a key strategic link of approx. 10.8 miles, of A-class forest road network. Bridge of Orchy (A82), intersecting the fragile public road (B8074), linking onto the A85.
- Creates further opportunities for tourism, fishing, hill walking, running clubs, outdoor centre's (kayaking), etc.





Glen Orchy Compact200 Bailey Bridge.mp4



Any questions?... Thank you for listening