

Objectives

- Overview of harvest planning
- Road location



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Factors Affecting Planning

- Mill requirements
- Environmental factors
- Operational factors

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Factors Affecting Planning

- Economic factors
- Other factors

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Harvest Planning Steps

1. Collect all available data about tract

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Harvest Planning Steps

2. Perform a reconnaissance and note:

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Harvest Planning Steps

3. Layout initial plan on map or aerial photo or both

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Harvest Planning Steps

4. Locate and mark initial plan details on the ground

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ROAD PLANNING



1. What is the road to be used for?
 - Timber Harvesting - Recreation
 - Protection - Multiple Resource Uses
2. What are the physical constraints?
 - Topography - Soils
 - Water - Visual Protection
3. What are the economic constraints?
 - Type of vehicle to use road
 - Number of vehicles per day
 - Maintenance commitment

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Factors Affecting Road Construction and Location

1. Topography
2. Soil texture
3. Slope
4. Aspect
5. Precipitation
6. Number & size of culverts and bridges
7. Drainage
8. Amount & type of rock
9. Density & size of vegetation to be cleared

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Factors Affecting Road Construction and Location

10. Season of major use
11. Timber type & density
12. Availability of surfacing material
13. Maintenance
14. Road purpose & life
15. Organizational policies
16. Overhead, planning, and engineering
17. Boundary lines & rights of way

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Reconnaissance

- office & field work based on:
 - topo maps, soil survey maps, land ownership plats, aerial photos
- locate control points

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Reconnaissance (cont.)

- determine elevation of and distance between control points
- determine grade between control points
- walk alternative routes
- walk proposed route
 - use Abney or clinometer, hand compass, flagging to mark ground location of control points

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Preliminary Location

- field survey to layout road centerline including curve layout and determination of cross sectional contours
- gravel sources located

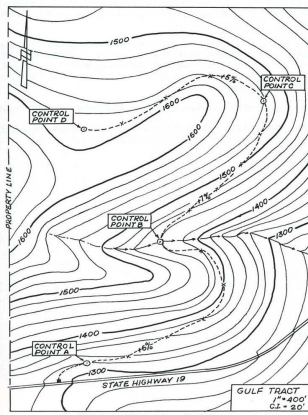
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Final Location

- final location of road centerline
- right-of-way clearance
- setting of slope stakes for cut and fill
- layout of final approaches to bridges

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Control Points



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Common Locations for Logging Roads

1. Wide valley bottoms
2. Hollows
3. Benches
4. Hillsides
5. Narrow ridges
6. Wide ridges

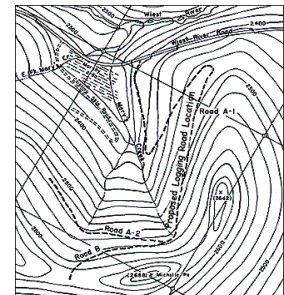
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Wide Valley Bottoms

- Proximity to public roads helps to reduce construction of long access roads
- Usually resemble wide flat-bottomed ditches which have been graded a foot or more below the ground surface
- Advantages:
 - earthwork volumes low
- Disadvantages:
 - grades too gentle to provide drainage
 - culverts ineffective due to poor outlet drainage & soft soils

Hollows

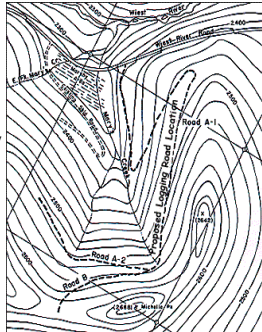
- Roads usually built on either side of stream
- Usually criss-cross from one side of the hollow to the other
- Disadvantages:
 - interfere with stream channel
 - lack of permanence
 - potential for equipment damage
 - small sites for landings



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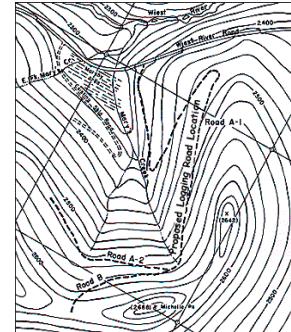
Benches

- Favorite location for Eastern loggers
- Advantages:
 - provide long, level sections of road, parallel to hill
 - earthwork volumes are low
 - landings and turnouts can be easily constructed
- Disadvantages:
 - location on the bench is limited
 - seeps & mudholes are common drainage problems
 - soils are often soft & may be unable to support loaded trucks

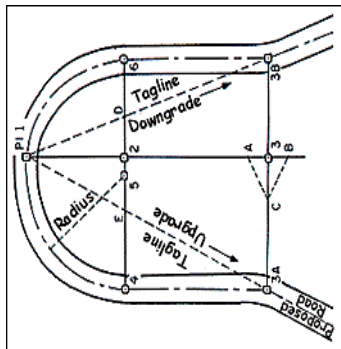


Hillside

- The number of roads on the hillside is often large and often appear to have been randomly located
- Advantages:
 - soils are usually stable and easily compressed
- Disadvantages:
 - result in long, unbroken grades or sections with steep grades
 - may require frequent switchbacks
 - erosion is usually pronounced
 - may require large cuts and/or fills



Switchbacks



- Need plenty of room
- Little side slope
- Need to reduce grade of road coming into and out of switchback
- Grade of switchback should not exceed 8%

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Narrow Ridges

- Advantages:
 - soils are usually sandy and quick draining
- Disadvantages:
 - low timber volumes on ridge tops; most timber is below road
 - usually inaccessible after rains because hillside routes become impassible

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Wide Ridges

- Usually one main road with several spur roads leading out to lesser ridges and down into major hollows
- Advantages:
 - soils usually can support heavy loads
 - large landings are easily constructed
 - earthwork volumes are low
- Disadvantages:
 - roads usually have poor alignment
 - mudholes are common
 - road surface is often graded below ground surface

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Areas or Conditions to Avoid

1. Low or swampy areas
2. Long level sections where poor drainage may occur
3. Rocky areas
4. Steep side slopes requiring large cuts and fills
5. Sharp curves or switchbacks

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Areas or Conditions to Avoid

6. Steep grades
7. Streambeds & frequent stream crossings
8. Areas with high water tables or many springs or seeps
9. Areas with high natural soil erosion and/or natural slope instability
10. Northern exposures

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Road Construction Process

- 1. Clearing
- 2. Grubbing
- 3. Inspection of cleared "r-o-w"
- 4. Excavation and embankment
- 5. Placement of drainage structures
- 6. Surfacing

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Cross-section of road sections

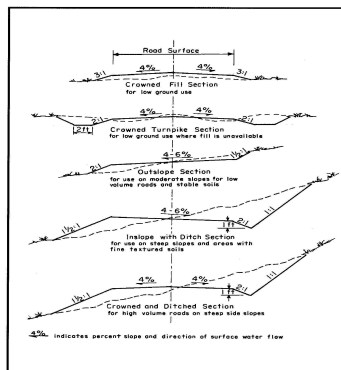


Figure 9. The choice of cross-section for a road or section of a road depends on drainage needs, soil stability, slope, and expected traffic volume. Dashed lines indicate natural land contours, and solid lines indicate constructed road. (Redrawn and adapted from Michigan Department of Natural Resources 1994, p. 23)