Common Biomass Conversion Systems

Alternative Transport Step: Tractor-Truck and Open Top Chip-Van

Tractor-Truck & Open Top Chip-Van

CTL Biomass Conversion Systems

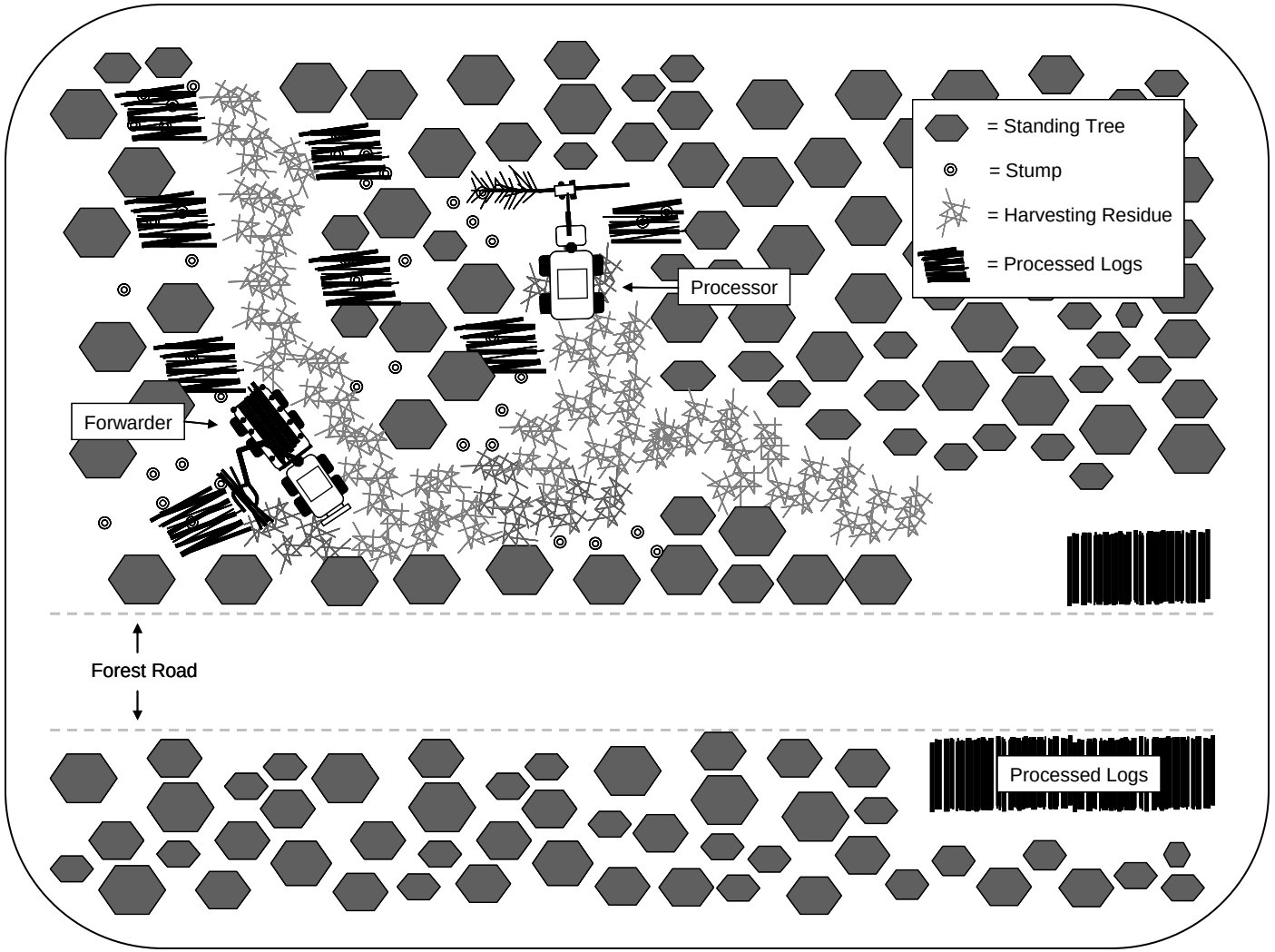
Harvesting Step: Cut-to-Length (CTL) System


Processor


Forwarder

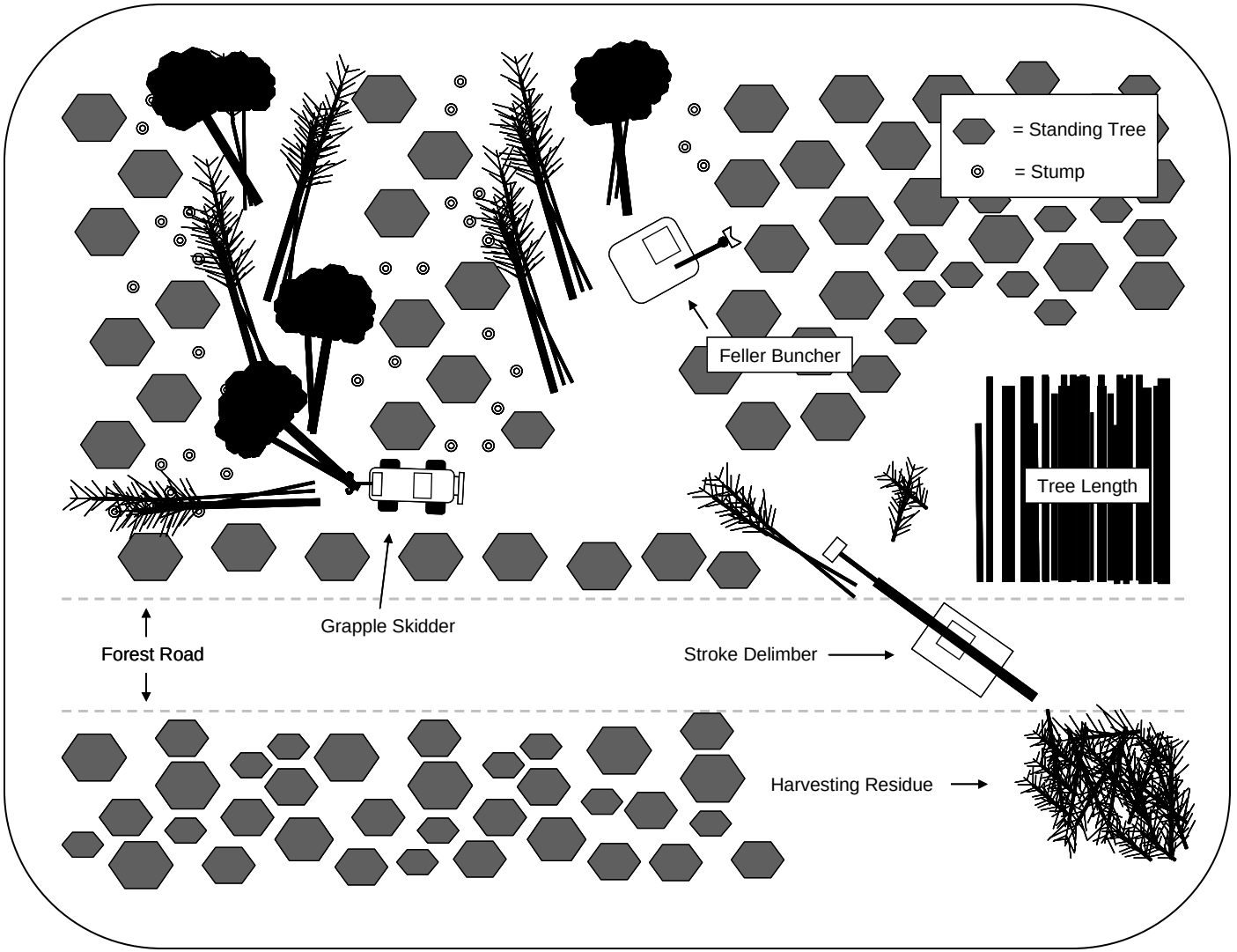
CTL Biomass Conversion Systems

Harvesting Step: Cut-to-Length (CTL) System



Common Biomass Conversion Systems

Harvesting Step: Mechanical System



CTL Biomass Conversion Systems

Accumulation Step: Bundler & Forwarder

Bundler

Fowarder

CTL Biomass Conversion Systems

Processing Step: Deferred till Manufacturing Facility

CTL Biomass Conversion Systems

Transport Step: Tractor-Truck and Log Trailer

Tractor-Truck & Log Trailer

CTL Biomass Conversion Systems

Alternative Accumulation Step: Forwarder

Forwarder

CTL Biomass Conversion Systems

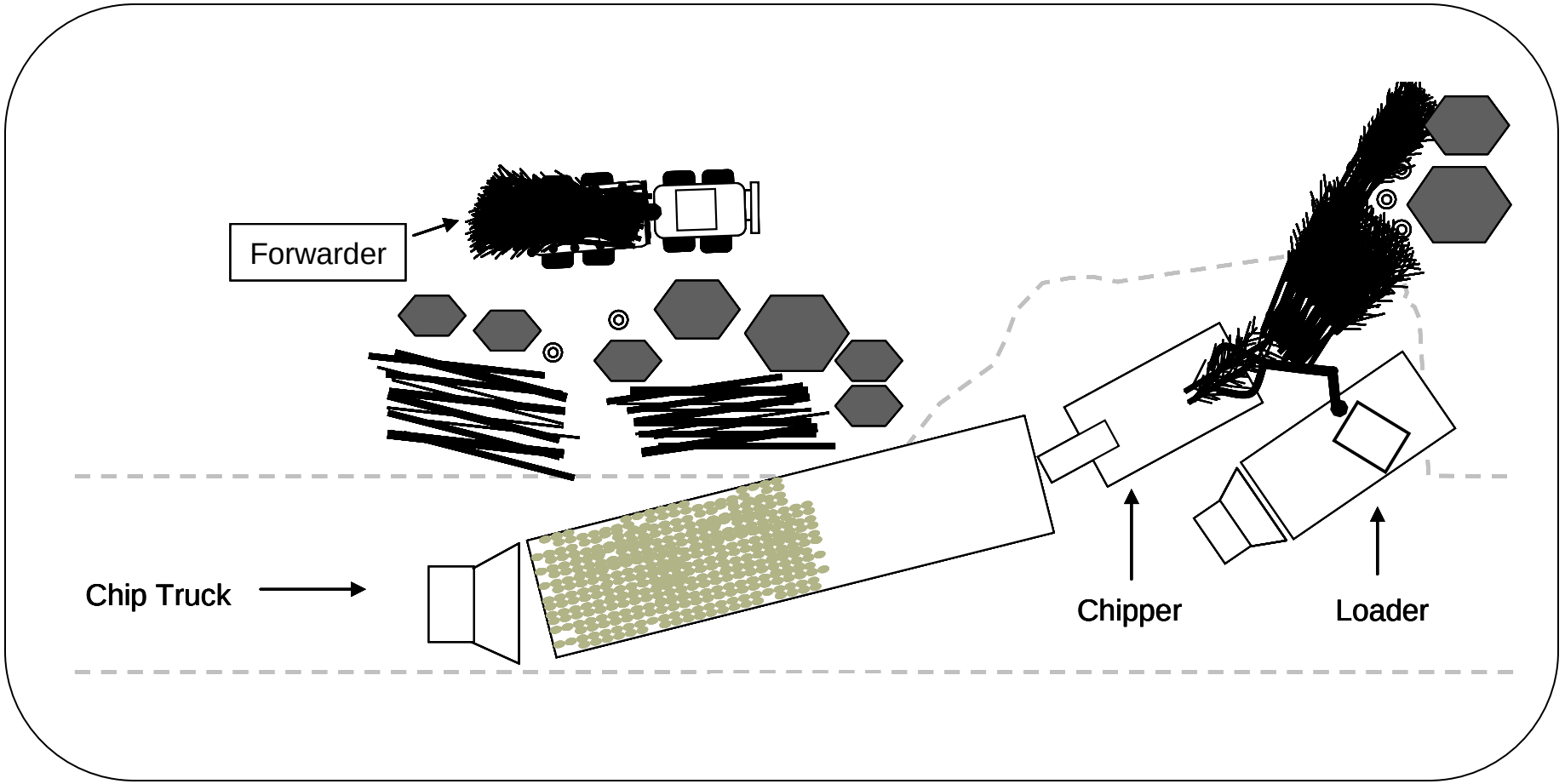
Processing Step: Whole-Tree Chipper & Loader on Crane Carrier

Whole-Tree Chipper

Loader on Crane Carrier

CTL Biomass Conversion Systems

Processing Step: Whole-Tree Chipper & Loader on Crane Carrier



CTL Biomass Conversion Systems

Transport Step: Tractor-Truck and Chip-Van

Tractor-Truck & Chip-Van

SWOT Analysis – Biomass Processing Equip.

Strengths

- Familiar with working and utilizing material in the forest environment
- "Recent" transition to mechanization
- Complimentary business operations and infrastructure
  - Garage and mechanical staff
  - Lowbeds
  - Office and administrative staff

SWOT Analysis – Biomass Processing Equip.

Weaknesses

- Use to handling and utilizing roundwood products, not harvesting residue
- Chippers and grinders break down frequently and can be complex to work on
- Limited supply of quality operators

SWOT Analysis – Biomass Processing Equip.

Opportunities

- Increase total harvest volume
  - Harvesting residue is estimated to represent 10-20% of roundwood volume (Bently et. al, 2004 & REC, 2007)

- Market diversity

- Decrease turn time and fuel consumption for grapple skidders
  - Skidding harvesting residue back into the woods adds approximately 1 to 1.5 minutes to every turn.

SWOT Analysis – Biomass Processing Equip.

Threats

•Harvesting residue is often brought back into the skid trails to minimize impact to wet areas

- •Increased downtime associated with weather

•Larger roadside landings

•Market failure

- •Stuck w/ specialized equipment

•Decrease delimber productivity

Establishment of Biomass Processing Operations

Framework for contractors to consider:

- Business plan
  - Demand (e.g., purchasing facilities)
  - Resource Supply (e.g., wood volume)
  - Competitors (e.g., other biomass processing companies)
  - Cost and Revenue projections
  - Financing (e.g., sources of funds)

- Production Balancing
  - For example:
    - Annual logging roundwood production = 100,000 tons
    - Estimated Harvesting Residue production = 15,000 tons
    - Minimum Economic Chipper production = 35,000 tons
    - Gap Harvesting Residue volume = 20,000 tons

Establishment of Biomass Processing Operations

Framework for contractors to consider:

- Fit with Existing Operations
  - Compatible processing and transport options with existing harvesting equipment
    - Implications on trucking costs (e.g., backhaul options)
  - Complimentary to existing business operations and infrastructure

- New or Used Equipment
  - Trade offs between ownership expenses (e.g., loan payments, insurance, etc.), machine utilization, and maintenance and repair costs.
  - Cost volatility higher for used equipment

- Risk Management
  - Leasing equipment
  - Contract terms (e.g., long-term supply, repurchase, take-or-pay)
  - Purchasing equipment with alternative uses

Establishment of Biomass Processing Operations

Public Sector Support or Promotion of Biomass Processing Operations:

- Promote a healthy and stable wood bioproducts industry

- Lower ownership costs through interest rate reductions
  - Maine Forest Service BMP Direct Link Loan program

- Establish a **cost share** program to reduce start-up costs
  - Business plans
  - Recruiting operations
  - Creating and reviewing contracts

- Facilitate Knowledge Transfer & Other Education Related Activities
  - Workshops
  - Technical writings
  - Equipment demos

Concluding thoughts

•Harvesting residue is an import raw material source for wood bioproducts

•There are four steps associated with utilizing harvesting residue:
    •Harvesting, Accumulation, Processing, and Transport

•Utilization of harvesting residue is more expensive on CTL harvest systems than whole-tree systems because the harvesting residue is dispersed throughout the block, opposed to centralized alongside the road.

•SWOT analysis well balanced

•Careful planning and use of risk management tactics can minimize threats and weaknesses.

•A strong and stable industry is critical to support and promotion of biomass processing operations

Questions?

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