



# **A Hauling Logistics Pilot Plan to Enhance the Strength and Vitality of the Nation's Timber Harvesting/ Hauling Network**

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Industry Version

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## Executive Summary

The project team was tasked with identifying a wood basket for an “open platform” Timber Hauling Pilot with suitable willing participants in the form of logger/suppliers and mills owned by the project’s Sponsors. The key concept underlying the “open platform” Pilot was to expand the network of a timber truck’s activity beyond a single logging crew and, thereby, increase truck utilization by making spare haulage capacity available to crews that are short of trucks.

Meetings and interviews were held with logging contractors, trucking firms, timber companies and other industry parties in Alabama, Georgia, South Carolina and North Carolina during May and June 2016. The purpose of these meetings was to obtain input on the current state of haulage operations, the potential for a Pilot and interest in participating. The project team engaged with 60 people from 36 industry-related organizations.

Most of those that met with the project team confirmed that timber haulage was a significant issue for their business and the industry. While truck utilization was related in some way to most of the points raised at meetings, it was not always considered the most pressing matter. Some of the things of greatest concern to the contractors/timber suppliers were the shortage of drivers, highway weight restrictions, log book compliance and insurance cost/limitations. There appears to be real opportunity for the U.S. Endowment for Forestry and Communities (Endowment) and its Sponsors to provide worthwhile support in addressing several of these issues and engagement with the relevant industry groups is recommended.

While Harvesting and trucking capacity can adjust to match market demand for these services over the longer term, capacity can be regarded as relatively fixed on a weekly basis. Reducing production constraints on timber harvesting and transport can have a very positive impact on the timber supply chain. The experience shared by loggers/suppliers was that the weekly production potential of a harvesting operation was regularly hampered by truck shortages. Slow turnaround at mills and excessive haul distances are perceived as operational factors that often contribute to the situation. Mill quota allocations, particularly towards the end of most weeks, limit productivity and can leave suppliers with excess truck capacity, which they often park.

The supply chain dynamics faced by logger/suppliers can differ markedly. Some are more affected than others by timber delivery quota restrictions. An apparently universal issue for logger/suppliers is uncertainty of market access over any given week. A significant number of logger/suppliers report being regularly blindsided by deliveries being halted unexpectedly towards the end of a week. Greater visibility of upcoming mill delivery requirements is fundamental to efficiently matching harvesting and transport capacity to mill supply requirements.

A logger-owned truck hauling from the same crew, day in day out, still appears to be the most common working arrangement for timber trucks in the US South. This practice internalizes and covers a multitude of challenges, which only become issues when a truck’s haulage network is expanded. There are many network expansion issues, including commercial, administrative, operational, performance, cultural and technological factors.

The project team has conceived of a potential Pilot as having two distinct stages which should be a period of benchmarking followed by a period trialling a scheme to improve

truck productivity. Any Pilot result will be more meaningful if it is preceded by a “business as usual” phase that can set a benchmark for performance of the current model.

The aim is to measure the productivity of trucks and logging crews and how woodflow performance impacts on suppliers and receiving mills. Trimble Forestry’s WSX dispatch solution is a customized forestry logistics system that would be a good candidate for collecting and managing all of the information required in the Pilot. The WSX system is used widely for tracking and dispatching timber in a hot-deck logging context. The system tracks deliveries, which are recorded in relation to timber supply chain plans and events. It has been used in the US PNW for a similar purpose and should not require customization for the project.

The Network Expansion phase of the Pilot could take a number of forms. At one extreme, it could be a complete separation of truck logistics management from harvesting management, with a pooled truck fleet being dispatched centrally to meet uplift and delivery objectives. This model is likely to produce the greatest improvement in truck utilization. The disadvantage of a Central dispatch approach is that a change of such magnitude may face too many challenges compared to one involving a more limited expansion of haulage networks, particularly if more than one logger is involved.

Interest in participating in a Pilot was indicated by several large contractor/suppliers that operate in wood baskets in Central, S or W Alabama, N Florida, SE or Central Georgia and Inland or Coastal South Carolina. A list of prospective participants was compiled by the project team but it is far from exhaustive. Any logger/supplier(s) involved in a Pilot must be strongly capable and motivated to meet the Pilot objectives. The scope of the Pilot must be realistic and, perhaps, conservative - the cause can be advanced by a small success but derailed by failing with a Pilot that is too ambitious.

The project team considers that two mid to large-sized logger/suppliers, which control approximately 30-50 trucks each, would be ideal for the Pilot. The operating model attempted in the Pilot phase can be designed jointly with the loggers involved to ensure it is feasible and that there is strong commitment. Prospective participants can be profiled based on industry or peer endorsements, capability, motivation, professionalism of personnel, willingness to share information and appropriateness of operations/woodflow. The project team is of the view that suitable participants can be found and that the selection process can commence once the preferred form and location of the Pilot are confirmed.

It is proposed that the benchmarking and proving phases of the Pilot will be for a total period of 7 months. The provisional assumption is that the Pilot will run from Nov 2016 to May 2017. A budget has been estimated for the Pilot. This covers the expected costs of preparing, performing and reporting on the Pilot, including technology and training requirements. The involvement and assistance of the participants’ managers and the Sponsors’ procurement personnel will be essential during the Pilot, particularly at the outset.

It is contemplated that Growing Excellence will provide oversight of the Pilot and liaise with the participants and Trimble on advancing the Pilot. It can also periodically update the Endowment and Sponsors on progress.

## 1. Acknowledgement

It would have been very difficult to complete this project without the invaluable support of the South Carolina and Alabama Forestry Associations, South Carolina Timber Producers Association, Alabama Logging Council, Southern Loggers Cooperative, Wood Supply Research Institute and the Sponsors, who convinced contractors involved in timber trucking to either attend meetings or participate in interviews with the project team.

This report is based on meetings and interviews with those contractors, suppliers, timber company representatives and other forest industry observers, all of whom engaged positively with the project team in presenting their perspectives. The team is extremely grateful for the help they received. Funding was provided by the U.S. Endowment for Forestry and Communities and the USDA Forest Service, Region 8 Atlanta.

## 2. Project Objectives

The aim of the project is to develop plans for a Forestry Hauling Logistics Pilot in the US Southeast. The U.S. Endowment for Forestry and Communities (Endowment) request for proposal defined the project's primary objective as - "to aid in developing plans for and potentially implementing an open-platform raw material hauling logistics pilot within a specific region of the southeast U.S. that would involve multiple producers and consuming mills representing multiple product lines. The objective is to identify, test and quantify specific means as well as gains that will best serve to benefit all parties (producers, consumers and contractors) thus resulting in enhanced strength and vitality of the pilot participants that can be shared with the broader forest products sector."

### 2.1. Meetings & Interviews

Meetings and interviews were held with logging firms, trucking firms, timber companies and other industry parties based in the US Southeast. The purpose of these meetings was to obtain input on the current state of haulage operations, the potential for a Pilot to test alternative approaches, and interest in participating in a Pilot. Meetings and interviews were held in Alabama, Georgia, South Carolina and North Carolina in May and June 2016. The project team engaged 60 people from 36 industry-related organizations. The people involved in these meetings were predominantly loggers, many of whom purchased standing timber and used a fleet of mostly their own trucks to haul almost exclusively from their own operations. Other parties that met with the project team were:

- Medium to large-sized trucking contractors that provided timber haulage services to loggers
- Contractors that undertook by-products haulage
- Procurement managers for timber processors manufacturing wood, paper and energy products
- Large timberland owners and the USDA Forest Service
- Other observers involved in the industry, including forestry academics, an insurance representative, industry body representatives and a sector journal publisher

The concept of an "open platform" logistics Pilot was generally received by the meetings as a "solution looking for a problem" - and most engagements were initially dominated by discussions about what problems a Pilot might address. Most of those that met with the project team confirmed that timber haulage was a significant issue for their business and the industry. Timber haulage productivity was not, however, seen as the most pressing matter, even if it was related to issues that were of higher concern. A summary of the key issues and opportunities raised in relation to timber trucking is set out in the table following.

## Summary of Key Issues & Opportunities Recorded

Aspect	Issues & Opportunities of Relevance to Timber Trucking
Drivers	Driver shortage - current and forecast
	Low production and earnings of drivers
	Long work hours for drivers
	Poor perception of potential new drivers
	Competition for drivers between loggers & trucking contractors and from other industries
	Old average age of current drivers
	Excessive minimum experience requirements for new drivers (Insurance requirement)
	TeamSafeTrucking initiative - to improve insurability and driver acceptance
Regulations	Low weight limits on Interstate highways and State roads
	Potential to get support of Endowment and Sponsors for solving regulatory issues
	Overloading of trucks
	Regulatory requirements to haul between States
	Inconsistent enforcement of weight limits by mills
	December 2017 implementation of Federal Motor Carrier Safety Administration electronic driver hours recording regulation
	Perception of poor regulatory compliance & enforcement for independent trucks
Insurance	Rising cost and diminishing availability of liability insurance for timber trucks
	High accident rate of small independent truckers
	Insurance requirements encouraging GPS tracking of trucks
Mill Demand	Delivery quota curtailments at mills during the week
	Limited notice of changes in mill delivery requirements
	Price changes for gatewood on very short notice
	Demand fluctuations from week to week
	Lengthy mill turn times
	Limited mill/yard opening hours
	Insufficient Wood Yard capacity and limited use of inventory management to support a consistent level of deliveries from loggers/suppliers
	The need to manage fiber age in mill timber inventories

Aspect	Issues & Opportunities of Relevance to Timber Trucking
Productivity	Productivity and efficiency of harvesting and trucking constrained by quota cut-offs
	Impact of fluctuations in transport capacity on harvesting
	Shortage of dependable/professional independent trucking capacity
	Inconsistent availability of work for independent trucks
	Potential reduction of driver hours to comply with FMCSA rule implementation
	Lack of investment in new efficient trucks
Expanding Truck Networks	Logger fear of not controlling own trucking
	Lack of trust to cooperate on trucking
	Loggers reluctant to work together on haulage
	Insurance coverage at another logger's operation
	Relying on loading performance of another logger
	Relying on road conditions at another logger's operation
	Perception of low market rates for timber haulage
	In-woods turn times
	Most loggers get much less than 50% loaded miles
	Many loggers/suppliers would like to contract out trucking
	Large loggers can internalize logistics challenges
	Small loggers stand to gain most from working with others on haulage
	Logger cooperatives to internalize issues from pooling trucks
	By-products truckers working together to manage surges
Full separation of truck management from crews - and dispatching a pooled fleet	
Market	Truck haulage rates below cost - logging subsidizes trucking
	Market power of fewer larger mill owners
	Overcapacity of logger/suppliers in some markets
	Shortages of 3
	Profitability of all aspects of the supply chain
	Market power of fewer bigger logger/dealers
Operating Conditions	Lack of visibility for supply or demand
	Fluctuations in average haul miles impact on truck output
	Surges in by-product haulage requirements
	Yard materials handling infrastructure

Aspect	Issues & Opportunities of Relevance to Timber Trucking
Facilities	Benefit of more satellite yards
Equipment	Use of inefficient, low quality trucks by small independents
	Use of set-out trailers
	Over the road trucks hauling by-products trailers to increase surge capacity
	GPS tracking of trucks

*A more complete record of the points raised/ discussed at meetings and interviews is appended in Section 8.*

## 2.2. Relevance of Operating Issues to Truck Utilization

The key concept underlying the “open platform” Pilot is based on the fact that initial funds are being provided by the Endowment and Forest Service which carries a requirement that at some point learnings be openly available. Secondly, the “open platform” approach is designed to help reduce concerns about anti-trust where multiple competitors are collaborating in an initiative. The desire is to expand the network of a timber truck’s activity beyond a single logging crew and, thereby, increase truck utilization by making spare haulage capacity available to crews that are short of trucks. Truck utilization is related in some way to every aspect of the points raised/discussed at meetings or interviews, as indicated by the following:

- More production from existing trucks/drivers is positive for truck profitability, driver pay and a shortage of drivers and trucks
- Mill demand and quotas can impact materially on truck utilization and harvesting productivity
- Harvesting productivity can be limited markedly by truck capacity shortages
- Operating within an expanded haulage network typically requires a higher level of monitoring and associated compliance, e.g. GPS tracking. This provides greater operational visibility, which helps enable better supply chain responsiveness.



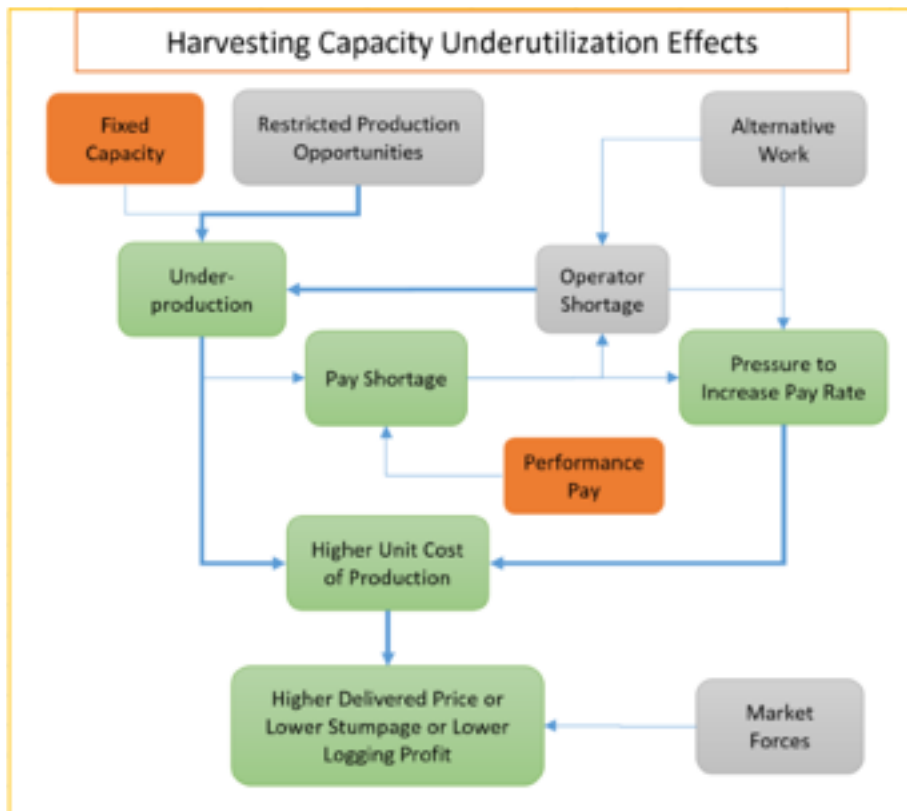
### 3. Timber Harvesting Utilization Factors

Timber harvesting and trucking activities are closely linked. Harvesting output can limit trucking productivity and vice versa. While timber harvesting and trucking capacity can adjust to match market demand for these services over the longer term, capacity is relatively fixed on a weekly basis.



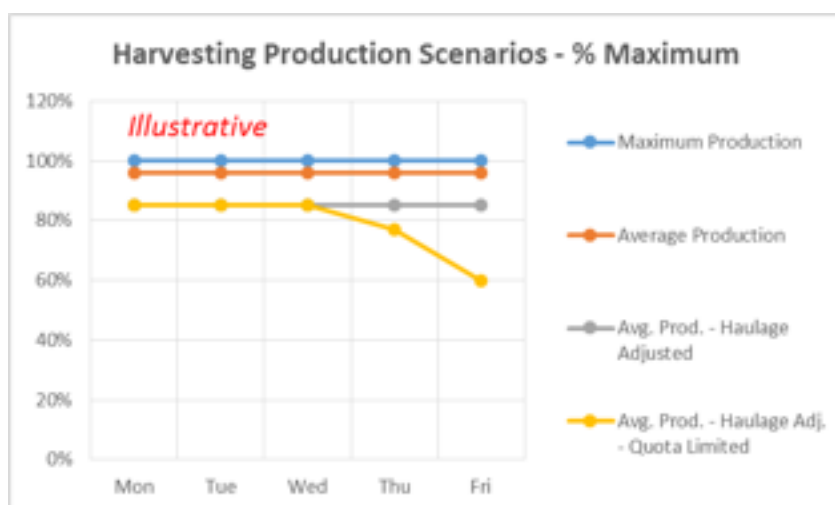
Underproduction during a week, whether it be due to weather, low demand/quota restrictions, trucking shortages or low harvesting and transport productivity, has a pervasive negative impact on harvesting and supply operations.

Production constraints on timber harvesting and transport can have a very negative impact on the timber supply chain, as illustrated in the diagram following.



### 3.1. Timber Trucking Under Utilization

The experience shared by loggers/suppliers was that the weekly production potential of a harvesting operation was regularly hampered by truck shortages. Slow turnaround at mills and excessive haul distances are perceived as operational factors that often contribute to the situation. Mill quota allocations, particularly towards the end of most weeks, limit productivity and can leave suppliers with excess truck capacity, which they often park. Other truck shortages can be due to maintenance downtime, a lack of drivers or inadequate base capacity. Haulage limitations are less important when harvesting production is low due to restricted demand or poor harvesting productivity. The impact of bringing in trucks from other crews or holding cut timber loads in the woods is excluded from the hypothetical utilization chart below.



Fluctuations in harvesting and haulage productivity do not always coincide and this manifests itself as either a shortage or surplus of trucking capacity, particularly for the individual logging crew. A useful Pilot needs to address the actual profile of under-utilization in both timber harvesting and trucking activities.

### 3.2. Supply Chain Uncertainty

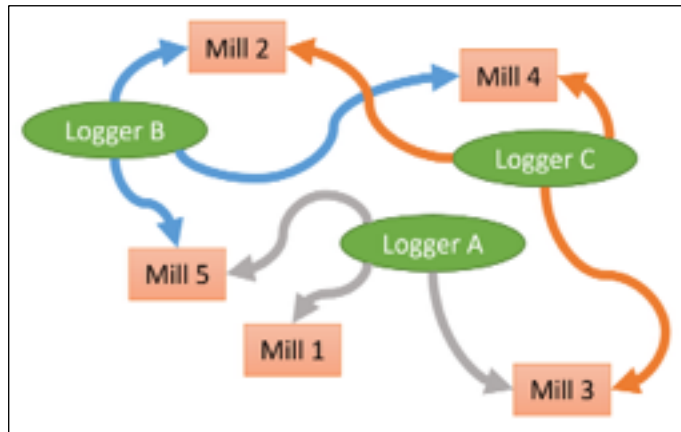
The supply chain dynamics faced by logger/suppliers can differ markedly. A logger/supplier with close ties to a timberland owner or timber processor can enjoy more consistent access to markets and fewer operational disruptions. At the other extreme, a logger/supplier may have more opportunities to trade with a range of customers but less certainty of market access. An apparently universal issue for logger/suppliers is uncertainty of market access over any given week. A significant number of logger/suppliers report having no agreed timber purchase quota on a weekly basis and/or being regularly blindsided by deliveries being halted unexpectedly towards the end of a week.

Greater visibility of upcoming mill delivery requirements is fundamental to efficiently matching harvesting and transport capacity to mill supply requirements.

### 3.3. Barriers to Expanding Truck Hauling Networks

A logger-owned truck hauling from the same crew, day in day out, still appears to be the most common working arrangement for timber trucks in the US South. This practice internalizes and covers a multitude of issues, which become significant when a truck's haulage network is expanded.

#### Timber Truck Haulage Network Example - Illustrating Potential to Expand Network from 3 Routes @ 1 Crew to 9 Routes @ 3 Crews



The meetings and interviews identified a list of network expansion issues which can inform Pilot design and any subsequent haulage program.

There are many reasons not to make spare truck capacity at one logger (or even 1 crew) available to others.

#### Haulage Network Expansion Issues

Aspect	Matters to Resolve with 3
Commercial	Executed contract
	Agreed rate can be negotiated or set
	Perceived as a minimal and inconsistent market for 3 haulage. The impression is that subcontractor trucks perform a minority of haulage and work for rates that are too low to induce loggers to provide their own trucks to other loggers
	Agreed miles to mill
	Liability insurance - truck covered
	Liability insurance - logger covered
Administrative	Ticket return to logger
	Delivery verification and reconciliation for invoicing
	Bill of Lading - load documentation
	Tract ID with load and returned to logger
	Invoicing 3rd party
	Payment of 3rd party

Aspect	Matters to Resolve with 3
	Record keeping on sub-contractor work hours, drug tests etc.
	Management of issues that arise for owner's truck at another logger's job
Operational	Road standards
	Road conditions
	Truck and trailer equipment and operator compliance with site rules
	Truck & trailer capabilities/limitations, e.g. CTI, trailer configuration
	Does job involve changing and keeping track of set-out trailers
	Different Tract ID and Ticket systems, e.g. electronic Ticket
	Meet Chain of Custody documentation requirements
	On-site operating protocols
	Is there cellular phone coverage at the site
	Directions, location (site coordinates), approved routes
Performance	Will truck be on time and do as instructed
	Will the logger's own trucks get priority when waiting to load
	Is truck timing synchronized with loader activity
	Will truck be loaded in a timely fashion
	Will truck be loaded to maximum legal weight - will it be overloaded
	Will truck get paid on time, in full
	Can job be completed within legal hours
	Is new haul job near depot
	Will truck and logger each follow agreed protocols
	Will job result in violation of 100 mile radius log book rule
	Will logger hold load(s) in stock for arriving truck(s)
	Will job require International Fuel Tax Agreement tags to haul across State line
	What happens/who is responsible if a truck is damaged
What happens/who is responsible if logging equipment is damaged	
Cultural	Can I rely on an unknown truck to deliver my timber on time
	If one shares a truck with another logger, will the owner still be able to move all his own timber

Aspect	Matters to Resolve with 3
	A truck driver may feel disloyal to its logger by working elsewhere - and competition for drivers means that loggers fear losing drivers to other loggers
	Can the logger and the unknown truck contractor (driver) trust each other
	Will this truck potentially steal timber or fuel or cause other criminal activity on another's job
	Logger does not want to risk truck he owns at another logger's job
	Will the loader operator and truck driver be able to work together
	Giving some haulage work to a competitor
	Logger/trucker has much more tolerance of issues at own crew
	Will an unknown truck behave badly and hurt logger's reputation
Job Requirements	Are there additional equipment needs, e.g. Radio Telephone, GPS
	Is additional technology or dispatching/back office support required
	Is any training required to haul for/from a different logger
	Protocols required for offering haulage opportunities and spare haulage capacity

The truck network expansion issues are most easily managed where the truck capacity is shared across crews owned by the same logger, i.e. the issues are internalized. When other loggers are involved, particularly beyond a few loggers who are comfortable working together, then a Logistics Agent is the typical pathway to managing the truck network expansion issues.

### 3.4. Logistics Agent Role

When trucks expand their work network to other loggers, a facilitating agent (similar to a freight forwarder) is able to:

- Simplify commercial arrangements - trucks and loggers contract with the Agent, compared with every logger contracting with every truck that might work on its job
- Set and enforce operating protocols and standards - rules are more consistent and disputes are with the Agent rather than between loggers
- Streamline administration and management processes - Agent has collective scale and systems to deal with business efficiently and act on behalf of contractors.

An agent could be an independent 3<sup>rd</sup> party or a cooperative of loggers/truck owners etc. Where timber companies have fully separated trucking from harvesting (in the US and elsewhere in the world), they usually take the role of Agent by having separate service contracts with trucking and harvesting operators.

Businesses that are essentially agents or transport brokers are sometimes the most recognizable from the technology they employ to interface with customers and suppliers,

e.g. Uber. The potential for some kind of electronic message board, as has been suggested by a number of those at the meetings, may have merit as a way to post available loads and trucks. Some of the appeal of this information sharing concept lies in the fact that it could be a supplier-driven system with simple cooperation from, and minimal control assumed by timber companies. The practicality of this concept can be explored in a Pilot. Clearly there would be significant upsides to working through a logger/hauler cooperative.

#### 4. Pilot Design Considerations

Based on Sponsor and potential participant feedback the pilot project has been developed based on two core objectives:

1. Develop and test communication, management systems and processes to match excess harvesting capacity with excess trucking capacity that will generate savings and greater stability to the supply chain system.
2. Understand the base case operating environment so as to measure project outcomes.

Therefore the project team has conceived of a potential Pilot as having two distinct stages; a period of benchmarking followed by a period trialling a managed logistics scheme which would include both an open platform to communicate opportunities and a fleet scheduling phase to improve truck and harvesting operations productivity.

**Benchmarking First Stage** - The performance of any Pilot needs to be measured to determine whether or not it is in fact a useful business model. This means that it is necessary to monitor the trucks, loggers and mills etc. in the Pilot.

Any Pilot result will be more meaningful if it is preceded by a “business as usual” phase that can set a benchmark for performance of the current model. Furthermore, the final design of any “expanded haulage network” or “open platform” Pilot should be informed by a benchmarking exercise that identifies the nature of any productivity opportunities and to what they might be related. Productivity opportunities may include underutilized truck and crew capacity, reductions in truck turn times, back hauls etc.

The results of an initial benchmarking exercise may also help confirm the assumptions of some contractors, already considering their own logistics initiatives.

The tracking equipment, information systems and personnel required to undertake a benchmarking exercise will be much the same as that required to monitor and manage the actual Pilot. A broad outline of the process proposed is as follows:

1. Select Pilot participants and location(s)
2. Finalize plans jointly with participants
3. Install tracking and communications equipment
4. Collect base information and set up databases for recording supply chain metrics, operational data and events
5. Train participants in use of equipment and establish operating protocols for the benchmarking exercise
6. Commence monitoring “business as usual” for a period
7. Analyze information collected and report on performance

8. Finalize a Pilot design, which tests a multi-logger/trucking contractor haulage network, e.g. an “open platform” of some kind or managed logistics
9. Undertake the Pilot for a period and report on its performance.

#### 4.1. Pilot Relevance

The aim of any Pilot is not only to prove operating practices that improve performance in a trial context but to demonstrate something with wider potential application. The Pilot should be a catalyst that encourages worthwhile changes in industry practices, including:

- Trucks can expand their haulage networks beyond a single crew or a logger
- Trucks can increase their weekly utilization
- Loggers can routinely accept other trucks on their job
- Loggers can be more productive
- Mill managers can see value in providing longer term forecasts of their timber supply needs, more definitive weekly requirements and a more consistent daily window in which to make weekly deliveries for the benefit of logger/suppliers.

#### 4.2. Performance Measurement

The productivity of trucks and loggers involved plus the performance of the woodflow, and how these relate to each other, will be required for both the benchmarking and testing phases of any Pilot. Communication and truck scheduling systems have been identified for collecting and managing all of the information required.

The benchmarking exercise should capture actual performance for comparison against an estimate of potential performance. This will enable the scale and nature of any improvement opportunity to be quantified. The framework of a Pilot and factors that can be measured are set out in the following table.

##### Benchmarking & Pilot Measurement Framework

Aspect	Pilot Scale or Measurement	Comment
Conceptual Scope	Approximately 8-15 logging crews (= 30-60 trucks) - a logging crew is the fundamental unit of the Pilot	Owned by 2-3 logging Contractor/ Suppliers that operate in the same wood basket and supply facilities owned by some of the project Sponsors
	Logger & 3 owned trucks tied to each of the logging crews involved	A minority of trucks may also service crews outside the Pilot
	2-3 logistics and operational/ procurement personnel	Training and communication on protocols for information capture etc.
Truck performance	Truck turn times - in woods; at mill	From arrival till departure
	Travel and cycle times per delivery	
	Loaded and empty miles travelled	
	Calculated hours	Standard (expected) time to complete the haulage work undertaken

	Actual hours worked	Daily and weekly scheduled work hours Downtime/ unavailable hours by cause/ explanation
Harvesting	Weekly delivery plan	In truck loads
	Deliveries completed	Daily loads, Payload. Days on which under or over delivery achieved
	Daily & Weekly production	Including an assessment of the effects of downtime, truck shortages and quota delivery curtailments - the impact on productivity of other factors, e.g. ground conditions or tree size factors, will not be monitored in any detail
	Deck/Landing inventory	In loads, for completeness
	Actual hours worked	Daily and weekly scheduled work hours Downtime/unavailable hours by cause/explanation
Mill	Weekly delivery plan	Orders or plan for supplier in loads
	Actual deliveries	Daily loads
	Actual timber receiving/ open hours	Daily and weekly scheduled open hours Closed hours/ downtime by cause/ explanation - for a Pilot participant and for all suppliers

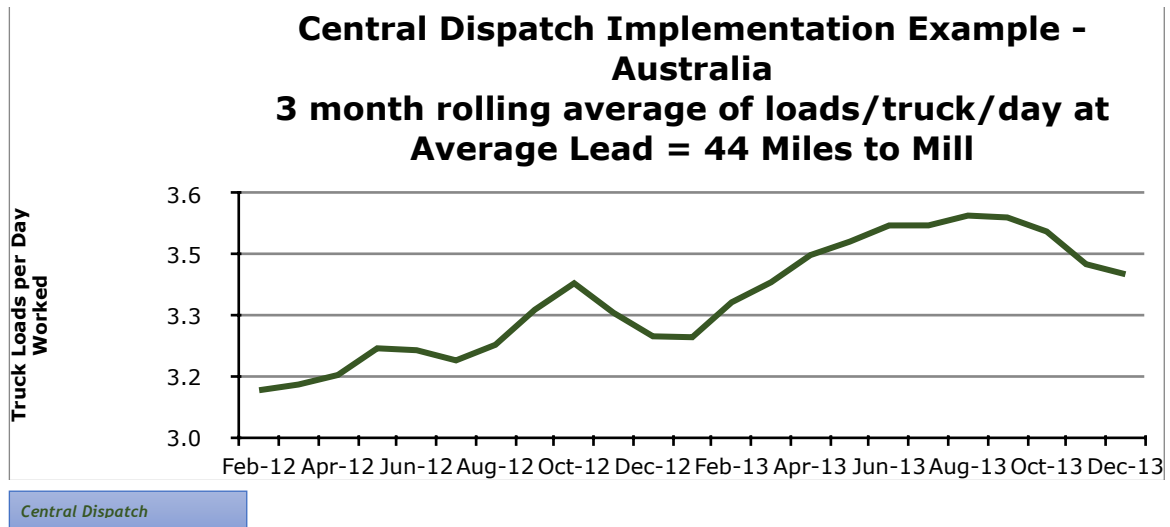
Daily “trucking events” that are captured include such events as: equipment breakdowns, road issues, delivery interruptions etc. This background information can then be used to help explain differences in performance metrics for trucks, crews and mills.

### 4.3. Form of Open Platform and Truck Scheduling Pilot

It is recommended that the pilot evaluate an open platform opportunities bureau service as well as contractors trucking fleet management.

The following example of the introduction of managed logistics models in Australia demonstrates the gains that are achievable over time - see chart following.





The disadvantage of a Central dispatch approach is that a change of such magnitude may face too many challenges compared to one involving a more limited expansion of haulage networks, particularly if more than one logger is involved.

Any initiative that expands truck networks, even if only slightly, will result in loggers having more of their haulage needs serviced by trucks they don't directly control. If loggers can increase their confidence in relying more on outside trucks, then this could ultimately encourage moves along the path to relying completely on outside trucks, i.e. full separation of harvesting and trucking.

Other considerations for any Pilot include the impact of set-out trailers and satellite storage yards. While these may not be the most important factors in determining the Pilot, their impact on performance can be evaluated if they are encountered in the Pilot.

#### 4.3.1. An “Open Platform” Pilot

This stage and component of the Pilot would enable the participating crews to share spare haulage capacity with other crews (in the Pilot) that were short of capacity - this is in line with the “open platform” Pilot concept.

The Pilot would be, in many respects, a continuation of the benchmarking phase but with some key differences. A virtual “bureau” would be established which facilitates bring loggers and other truck owners together at the outset of the Pilot to plan and prepare for the new operating arrangements. This would involve:

- Determining the precise scope of the Pilot in consultation with the participants - a bottom up design is critical to getting the level of participant commitment needed for a successful Pilot
- Reaching agreement on a process for establishing specific haulage rates, operating rules and protocols where required between participants.
- Finalizing and executing contracts between loggers and/or truck owners to expand potential haulage networks
- Working out how to manage the extra administration arising as a result of the Pilot, e.g. preparation of invoices for trucks hauling from a different logger, handling insurance documentation etc. It is envisioned that the Bureau would undertake much of this additional work.

While the logistics personnel involved in the preceding benchmarking phase of the Pilot can carry out much of the Agent’s administrative tasks, a local operational/management person will be required to play the leading role in resolving with the contractors how trucks will haul from other crews and obtain agreement on the protocols required. The interface with the Agent can be phone, radio telephone or electronic means for the purposes of a Pilot - an “App” or specific technology to help support the interface with the Logistics Agent can be considered if the Pilot produces promising results.

#### 4.3.2. Truck Scheduling Logistics Pilot

One medium- to large-sized logger/supplier with several crews could undertake a full truck scheduling Pilot that involves pooling all of its trucks and load by load dispatching, i.e. logistics management of the whole fleet by a dispatcher. This should be feasible as a single business can internalize and control most of the issues related to trucks working at other crews. Such a Pilot can test the difference between how trucks are currently utilized (with some sharing between the logger’s crews) and the level of productivity with logistics management of a pooled fleet.

Management of a pool of trucks with a dispatch system comes at a cost but enables a much greater control over deliveries. It should assist in meeting more precisely both mill quota targets and the uplift requirements of crews. It should also result in more robust deliveries records and handle much of the truck planning that is currently done by the logger. In addition to better truck utilization, these wood supply management benefits may be commercially significant to larger logger/suppliers.

Full separation of logistics management has the potential for the greatest increase in truck utilization and is likely to be most feasible and directly beneficial for the larger logger/suppliers. These loggers are a significant part of the industry and if a successful model can be established, it could have more impact on the industry than models involving smaller loggers cooperating.

### 4.3.3. Cooperative Truck Scheduling Logistics Model

There are scale economies in managing a large pool of trucks and, typically, more scope for capacity matching and optimizing truck utilization. One way to develop greater scale is to foster cooperative arrangements in timber haulage. The simplest way would be to recruit 2-3 large contractor/suppliers, who could most readily internalize the issues of hauling from other crews and jointly develop the operating rules for such a model. This is a further potential dimension of a Pilot.

In an ideal world, everyone from timber companies to owner-operator truckers might potentially cooperate on timber hauling through a logistics bureau/agency. A timber industry cooperative of some kind might ultimately run a bureau/agency for matching spare truck capacity to surplus loads. There are many US examples of cooperatives in primary agriculture. The best example within the forest sector is the Southern Loggers Cooperative.

### 4.3.4. By-products Pilot Option

There was some interest on the part of both a timber company and some contractors in a Pilot based on the haulage of by-products. Other parties interviewed felt that by-products haulage was already optimized by some of the Over the Road (OTR) contractors that handle most by-products as part of their overall freight operations.

One limitation of a by-products trial is that it would have limited involvement with harvesting operations, although there are many logging crews that operate in-woods chipping. There should be potential to improve by-products haulage productivity and test this by way of a Pilot but it is probably not the first priority.

## 4.4. Potential Participants and Location

Interest in participating in a Pilot was indicated by several large contractor/suppliers that operate in wood baskets in Central, S or W Alabama, N Florida, SE or Central Georgia and Inland or Coastal South Carolina. There appears to be good potential to enlist suitable contractor/suppliers in a wood basket in which at least some of the Sponsors have processing facilities.

## 5. The Proposed Pilot

In reviewing potential options for a Pilot, the project team has concluded that the three most important considerations are:

1. The benchmarking phase of any Pilot is fundamental - there is a need to better understand the nature, extent and causes of the hauling “problem” before finalizing the design of any alternative operating model
2. The logger/supplier(s) involved in the Pilot must be strongly capable and motivated to meet the Pilot objectives - other factors, such as the extent to which a logger/supplier is involved with supplying the Sponsors’ facilities, should be of less concern
3. The scope of the Pilot must be realistic and, perhaps, conservative - the cause can be advanced by a small success but derailed by failing with something too ambitious.

### 5.1. Recommended Pilot – 2 larger loggers with wood basket overlap

The project team considers that two mid- to large-sized logger/suppliers, which use approximately 30-50 trucks each to service their crews, would be ideal for the Pilot, for the following reasons:

- Larger logger/suppliers are a significant part of the industry
  - o A larger logger is more likely to have sufficient scale to run an internal program that optimizes its own trucking logistics
  - o If an improved operating model is demonstrated in the Pilot, there is potential for wide applicability
- Many of the challenges of sharing trucks between different logging businesses can be internalized and managed with only 2 logging businesses
  - o This reduces the challenges to a successful initial Pilot compared to involving more loggers
  - o A successful Pilot can demonstrate that it is possible to address the many issues that discourage sharing trucks with other loggers
- Larger logger/suppliers have survived the recent Global Financial Crisis and most of those that met with the project team appeared highly motivated to improve their businesses
- The management personnel of smaller loggers are more likely to be tied up with day to day operations and less able to support involvement in a Pilot.

The loggers selected are expected to have operations that overlap in a particular wood basket, which should enable them to cooperate on sharing truck capacity in a productive way.

### 5.2. Pilot Scheme

The Pilot can commence with a “Business as Usual” phase to benchmark current practice and identify the nature and potential size of any performance improvement opportunities at each logger. “Business as Usual” at a larger logger is expected to already involve some level of sharing trucks amongst its crews. In contrast, a lesser baseline level of truck sharing is expected for a small logging business.

In the Pilot phase, the aim is to expand the haulage network of each logger/supplier's trucks beyond whatever is "Business as Usual" for that logger. The operating model attempted in the Pilot phase will be designed jointly with the loggers involved to ensure it is feasible and that there is strong commitment. This phase could range from just providing better visibility of demand "open platform bureau" facilitating increased level of opportunistic truck sharing between crews to full pooling of the fleet and load by load truck scheduling, where any truck can be sent to any crew. This could be both internally at each logger and then cooperating by sharing trucks across the operations of both loggers. There are up to five potential phases of a Pilot:

1. Benchmarking
2. Internal sharing of trucks between crews at each logger
3. External sharing of trucks between the 2 loggers
4. Internal separating and pooling of trucks and dispatching across all crews at each logger
5. External pooling of all trucks at both loggers and dispatching across all crews at both loggers.

It is important that the Pilot tests a feasible operating scenario that enables truck productivity to be materially better than industry norms and can be applied elsewhere.

### 5.3. Participant Selection Criteria

Even the "Business as Usual" benchmarking phase of the proposed Pilot will require a level of attention/involvement on the part of the selected logging/trucking contractors that will potentially cause minor interference to the normal running of operations. Participating in the Pilot will require each logger's unflinching commitment, which is difficult to assess in advance. Each prospective candidate can be profiled based on the selection criteria in the table following.

#### Draft Logger Selection Criteria

Criteria	Aspects to Consider
Endorsement of suitability	<ul style="list-style-type: none"> <li>• Impressions from meetings &amp; interviews</li> <li>• Recommendations of Sponsors, their timber Procurement Managers, people involved in Industry Associations and other loggers</li> </ul>
Strongly capable business and motivated to meet the Pilot objectives	<ul style="list-style-type: none"> <li>• Well established and successful business</li> <li>• Openness to new logistics practices</li> <li>• Strong motivation to improve truck utilization</li> <li>• Can contribute to design of Pilot phase</li> <li>• Will ensure, within reason, that the Pilot can be carried out as planned and there is compliance with agreed Pilot practices</li> </ul>
Professional and capable people	<ul style="list-style-type: none"> <li>• Management personnel</li> <li>• Machine Operators</li> <li>• Truck Drivers</li> </ul>
Willingness to work with the Technology required for the Pilot	<ul style="list-style-type: none"> <li>• Familiarity of organization with computing and communications technology</li> <li>• Agreeable to the appropriate use of data loggers/GPS units installed in trucks and/or logging equipment</li> </ul>

Willingness to allow transparency of data, reporting and publishing of findings	<ul style="list-style-type: none"> <li>• Supports sharing of non-financial information gathered and results of analysis with Pilot Sponsors and the publication of results</li> </ul>
Appropriate logging operations	<ul style="list-style-type: none"> <li>• Number of crews</li> <li>• Type of logging undertaken by crews</li> </ul>
Suitable truck fleet	<ul style="list-style-type: none"> <li>• Fleet in good working order and drivers productive</li> <li>• Proportion of owned trucks and 3</li> </ul>
Suitable Woodflow	<ul style="list-style-type: none"> <li>• Supply a range of facilities, including some of the Sponsors</li> <li>• Potential back hauls woodflow mix and stability</li> </ul>
External influences	<ul style="list-style-type: none"> <li>• Haulage done for other loggers</li> <li>• 3<sup>rd</sup> party trucks that normally work for other loggers</li> </ul>

#### 5.4. List of Potential Participants

The list of prospective participants set out below is far from exhaustive but represents some of those engaged by the project team or otherwise recommended for potential involvement in a Pilot. While the project team met with a very small sample of the US Southeast industry, only a minority of the 28 Contractor/Suppliers encountered appeared indifferent to playing a role in a potential Pilot. The project team is of the view that suitable participants can be found and that the selection process can commence once the preferred form and location of the Pilot are confirmed.

##### Initial Pilot Prospects List

Location	Party
Alabama	Baseline Forest Services
	Industree Lumber & Logging
	Judson Inc.
	Kennedy Forest Products Inc.
	Mid Star Timber Harvesting
	Parnell Inc.
	Potts Brothers Logging
	Ranger Transport Inc.
	Reid Logging Co Inc.
	Timberland Harvesters
	Westervelt Lumber
	Georgia
KS Harvesters	
Pierce Timber Co	
Plains Logging Co	
Sanders Logging Inc.	

Location	Party
	Williams Brothers Transport Inc.
S. Carolina	Bootle Logging
	Ferguson Forest Products Inc.
	Ideal Logging
	JC Witherspoon Logging
	Leo Lambert
	Log Creek Timber Co
	Whitewood Inc.

Amongst the organizations listed above are a number of contractors that appear both well-suited to undertaking the Pilot and have indicated genuine interest in participation.

## 5.5. Timetable

The table below sets out a potential timetable for the recommended Pilot. It is proposed that the benchmarking and testing phases of the Pilot will be for a combined period of seven months. The provisional assumption is that the Pilot will require eight months to complete. Once the Pilot is approved, it is reasonable to assume that it will take 2-3 months to organize the participants and logistics management required.

### Draft Pilot Timetable

	Schedule of Operations	Management & Reporting
Aug 2016		<ul style="list-style-type: none"> <li>• Pilot Scheme approved</li> </ul>
Jan 2017		<ul style="list-style-type: none"> <li>• Funding and Project Manager for Pilot secured.</li> <li>• Participants, scope, logistics service &amp; management of Pilot resolved and finalized</li> </ul>
Feb 2017	Earliest probable start to setting up for benchmark phase with 1	<ul style="list-style-type: none"> <li>• Liaison with Trimble and participants</li> <li>• Establish protocols for communication, information capture etc.</li> </ul>
March 2017	Benchmark monitoring at 1 setup and training at 2	<ul style="list-style-type: none"> <li>• Implementation</li> <li>• Liaison with Trimble and participants</li> </ul>
April 2017	Benchmark monitoring at both loggers	<ul style="list-style-type: none"> <li>• Update report on Pilot establishment</li> </ul>
May 2017	Benchmark monitoring at both loggers	<ul style="list-style-type: none"> <li>• Dialogue with participants on rules of engagement</li> <li>• Protocols for cooperating on haulage logistics.</li> <li>• Report on benchmarking phase</li> </ul>
June 2017	Transition from sharing internally to loggers cooperating on sharing spare trucks across both businesses	<ul style="list-style-type: none"> <li>• Liaison with Trimble and participants</li> </ul>
July 2017	Pilot concludes with 2 loggers cooperating on sharing truck resources across both businesses to maximum feasible extent. May extend to full separation and pooling of trucks and load by load dispatching. Complete evaluation of opportunities for open platform load opportunities sharing	<ul style="list-style-type: none"> <li>• Liaison with Trimble and participants</li> </ul>
August 2017		Final Report on Pilot



## 5.6. Pilot Budget

An estimate of costs for a Pilot is set out below, assuming a 3 month benchmarking phase (+1 month to setup), followed by a 3 month Pilot (testing) phase. In the proposed budget, 2 experienced logistics personnel will manage the capture of benchmarking information and logistics management in the testing phase of the Pilot. The assumption is made that the Sponsors will provide one operational person to work with the logistics personnel - Sponsors could share this role. It is also assumed that Trimble Forestry will provide the WSX system tracking and scheduling system for the Pilot.

The involvement and assistance of the logging/trucking managers from the participants' businesses will be essential during the Pilot, particularly at the outset.

The Budget for the Benchmarking Phase includes an estimated cost for finalizing the selection of participating loggers/suppliers, which is assumed to be undertaken by Growing Excellence Inc., upon approval of the project by the Endowment. It is contemplated that Growing Excellence will provide oversight of the Pilot and liaise with the Participants and Trimble on implementing the Pilot. It can also periodically update the Endowment and Sponsors on progress.

### 5.6.1. Logistics Management Investment Proposition

An aim of this project is to conduct a Pilot that identifies and/or demonstrates potential commercial benefits. Some understanding of how best to capture any commercial benefits should come from the Pilot. In the case of separating logistics management from harvesting and dispatching a pool of trucks, there is some precedence as to the costs of a solution and likely benefits. Based on recent US West experience, a full dispatching solution (dispatchers + technology) will cost 3-5% of haulage costs and increase truck net earnings by 5-10%. This assumes a reasonable operating scale of, say, at least 50-100 trucks and that all commercial benefits accrue to the trucks.

The potential commercial benefits of sharing information on hauling opportunities (an "open platform" Pilot) should be clearer following the Pilot. There should also then be a better idea of the type of solution required to capture those benefits. The level of benefits will be lower than for a full managed logistics solution.

## 6. Logistics Management System

### Logistics Information System

Trimble Forestry's WSX dispatching system ([asset.co.nz/#solutions](http://asset.co.nz/#solutions)) is proposed for recording logistics information in the Pilot. The WSX system is used widely for tracking and dispatching timber in a hot-deck logging context. It was recently used in the US PNW to monitor timber haulage and supply operations in much the same way as proposed for the Pilot. While there are additional challenges in using the system for monitoring, compared to active dispatching, it is very well suited for the required analysis and reporting of performance.

As a dispatching system, WSX provides all the key information to enable responsive scheduling in a dynamic timber supply chain. WSX is a dedicated Timber Supply Plan Execution & Dispatch System. It was designed to manage the execution of weekly wood supply plans.

WSX facilitates tight control over the uplift and delivery of timber and provides end-to-end visibility of the wood supply process, including Web access and reporting. Distribution management systems in most other industries do not incorporate production and inventory monitoring, which is critical in forestry because the visibility and reliability of supply is usually a major challenge. The forestry operating environment is typified by remote sites, rugged conditions and a production process that can be highly uncertain. WSX is uniquely proven at providing the visibility required to manage log supply and distribution in the forestry environment.

### Portable Data Terminals (PDT's)

PDT's, incorporating GPS tracking, comprise a major item of expenditure in the Pilot. These are required to provide a common tracking platform that is synchronized with supply chain events in the WSX system. The budget for PDT's assumes MT Data's 7050 units will be installed in trucks and, possibly, some loaders ([mtdata.co.nz/Solutions/Vehicle-Tracking.aspx](http://mtdata.co.nz/Solutions/Vehicle-Tracking.aspx)).



## Logistics System Setup

Logistics personnel provided by Trimble Forestry can organize or carry out the setup of equipment & base data and preparation for monitoring. They can be assisted by a local industry representative, e.g. a logger or procurement person, to help explain what is required and assist in making the requirements fit with each logging job in a way that is acceptable to the logger, operators and drivers. The following needs to be undertaken in preparation for monitoring:

1. Install tracking devices (Portable Data Terminals = PDT's) in trucks and, possibly, loaders
2. Train each driver/operator in use of PDT's
3. Input operating details into Trimble Forestry's WSX database and GPS tracking system, e.g. crew, customer, truck, products, distance details, geofences etc.
4. Explain information requirements and establish communication protocols with drivers, crews and managers, e.g. weekly production plans, in-woods inventory updates etc.

## Data Collection

Once the system is in place, the recording of delivery and supply chain information can commence. Plans for the week's production and delivery of timber will be established at the beginning of each week. Weekly delivery plans to each mill can be assumed to be the logger's forecast of requirements rather than an actual order from the mill - at least during the benchmarking phase. The plan for the week is a benchmark against which actual performance can be measured.

Sample production and delivery performance reports from the WSX system are shown below (numbers are truckloads).

### Customers - Loads Delivered By Week By Day (Plan + Actuals)

Customer	Log Grade	Source	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Del	Plan	%
aaa	BRIS		11.27	15.31	13.70	6.61	4.87			51.76	71.00	73%
	UAB		13.27	18.99	21.71	35.60	28.91			118.48	103.00	115%
	UHR		41.74	29.94	30.41	28.77	48.86			179.72	173.00	104%
CHPP	Totals		66.28	64.24	65.82	70.98	82.64			349.96	347.00	101%
ddd	S2061		2.87	2.40	2.50	4.35				12.12	11.00	110%
	S20M		2.87	2.71	4.12	2.29				11.99	12.00	100%
	S3061		10.16	11.62	5.73	3.41	6.47			37.39	35.00	107%
	S30M		2.41	8.21	8.96	5.24	3.11			27.93	31.00	90%
CKAW	Totals		18.31	24.94	21.31	15.29	9.58			89.43	89.00	100%
cccc	FP35525		2.20		3.52	3.49	3.03			12.24	9.00	136%
	FP35585		1.41	1.47			1.06			3.94	9.00	44%
	Y30585		5.14	6.94	5.53	3.22				20.83	21.00	99%
CPLY	Totals		8.75	8.41	9.05	6.71	4.09			37.01	39.00	95%

### Weekly Production By - Crew by Location by Grade

Crew	Log Org	Forest	Tract	Landing	Grade	Open	Uplift	Close	Act Prod'n	Plan	%		
895	Combined	woods	101	01/90	A1		7.00		7.00	7.50	93%		
					A2	1.00	3.00	2.00					
					A3	1.00	6.00	5.00	6.00	83%			
					A4	0.60	1.00	0.40					
					A5	1.00	5.00	4.00	5.00	80%			
					A6	1.00	4.00	3.00	4.00	75%			
					B3	4.00	6.00	3.00	2.00	150%			
					B4		1.50	1.50	1.00	150%			
					B5	0.60	4.50	3.90	4.00	98%			
					B6	2.00	5.50	4.30	3.00	143%			
					B7		2.50	2.50					
					01/90	Total		11.20	46.00	1.80	36.60	32.50	113%

## Truck Journey Data

The logistics personnel will work with the trucks to record load details in the WSX system. While each stage of a truck's journey should be timed automatically via the tracking system, load details may have to be entered retrospectively in many cases. The logistics personnel will be tasked with getting every delivery recorded as completely and accurately as possible - this will be a challenge at times. Based on past experience, there will be an ongoing need to support drivers and others that are new to the system. The logistics personnel will also need to track down incomplete information and corroborate some delivery details.

Each delivery is a "journey" in the WSX system and is usually associated with a timber transaction (ticket). Examples of the data recorded for each journey are shown in the table following.

**Sample Information for 3 Truck Journeys (Showing 32 of 73 fields available)**

Ref	Load with 2 Timber Grades			To Depot Journey	Overnight Load	
	Journey	Ticket1	Ticket2		Journey	Ticket1
JourneyNo	1277626	1277626	1277626	1278487	1277137	1277137
Ticket	3629215 & 362	3629215	3629216		3626431	3626431
UpliftDate	28/06/2016	28/06/2016	28/06/2016	28/06/2016	27/06/2016	27/06/2016
DeliveryDate	28/06/2016	28/06/2016	28/06/2016	28/06/2016	28/06/2016	28/06/2016
Logger/Supplier	aaaa	aaaa	aaaa	aaaa	aaaa	aaaa
Cartage	ffff	ffff	ffff	gg	ffff	ffff
Truck	5646	5646		4606	5643	5643
Trailer	56460		56460	46060	56430	56430
Type	Std	Std	Std	Std	Std	Std
CTI				Y	Y	Y
Driver	Kevin	Kevin	Kevin	Bobby	RossJ	RossJ
Crew	xxx1	xxx1	xxx1	Depot	xxx2	xxx2
Timber Owner	woods	woods	woods		trees	trees
Tract	1704	1704	1704		2001	2001
Dump	01/319	01/319	01/319		02/323	02/323
Customer	Mill A	Mill A	Mill A	Mill W	Mill K	Mill K
Net Weight	30.04	11.78	18.26		31.78	31.78
Timber Grade		A	B			B
Depot Location	town			city	country	
Miles to Mill	97				174	
Miles to Crew	30			85	97	
LoadPct	76.37%			0	64.20%	
Start Time	4:47			14:17	10:00	
AtCrew	5:06				11:59	
Loaded	6:20				13:20	
AtCust	8:04				3:44	
Empty	9:12			16:01	4:19	
Cycle Time Hrs	4.4			1.7	6.4	
OnCartOvernight					Y	
OCEnd					14:02	
OCStart					1:57	

## Other Information Collected

In addition to capturing the metrics associated with timber supply, the WSX system is also used to record (and share) information on events that may affect supply performance. A sample Event Log is shown below. Some of this information can be helpful in understanding performance variations.

### Event Log - Detail

Start Date	Start Time	End Date	End Time	Hours	LogOrgs	Assoc. Type	Assoc.Item	D/T	Category	Sub-Category	Event
22/06/2016	15:13	30/06/2016	07:22	184:09	aa	crew	name	Y	General	General	CH: TRUCKS STILL ON HOLD TOMORROW CH:All good for 2nd round today
23/06/2016	16:31	28/06/2016	17:02	120:31	aa	crew	name		crew	Final Stocks	Final,finals for dump289
27/06/2016	08:25	27/06/2016	08:26	00:01	aa	crew	name		General	General	Solly gone home sick. Murray on the loader
27/06/2016	10:59	27/06/2016	10:59		aa	crew	name		Weather	Too Wet	Not pulling at the moment due to the high winds
27/06/2016	11:47	27/06/2016	16:00	04:13	aa	crew	name	Y	Weather	Too Wet	Crew gone home - Too windy,too dangerous
27/06/2016	15:58	28/06/2016	08:23	16:25	aa	crew	name	Y	crew	Hold Trucks	Can't take trucks until Second round - Road is a bit stuffed after moving the Hauler - Will call when ready to go - or call him after the sun comes up
28/06/2016	14:15	30/06/2016	10:00	43:45	aa	crew	name		Roading	Closure	CH:Road will be ready to take trucks 2nd round Thurs 30th
30/06/2016	08:10	1/07/2016	10:00	25:50	aa	crew	name		crew	Final Stocks	Will be finished pulling late tday,early tmro
1/07/2016	07:34	1/07/2016	07:36	00:02	aa	crew	name		crew	Request	MS:Prioritize 21 with trucks today, to get their stocks down
1/07/2016	07:55	1/07/2016	07:55		aa	crew	name		crew	Finishing Early	1pm ko today
15/06/2016	11:51	16/06/2016	17:00	29:09	aa	Customer	name		Stock	Request	MS:Reject load at Seq to go to Tas.Must pick up tmro(Thurs) between 9am-5pm
16/06/2016	07:28	16/06/2016	07:28		aa	Customer	name		General	General	trucks delayed at customer, loader has broken down at A&O
16/06/2016	16:13	17/06/2016	15:00	22:47	aa	Customer	name		Stock	Request	MS:Can go over the xtras on the order to clean out 86
20/06/2016	06:08	24/06/2016	15:00	104:52	aa	Customer	name		Stock	Priority	Priorities:A374,K374,K524,KM374,KI414
20/06/2016	06:09	23/06/2016	07:00	72:51	aa	Customer	name		Stock	Unavailable	MSch:Hold Lusitanica from 18 until Thurs
22/06/2016	13:37	24/06/2016	15:00	49:23	aa	Customer	name	Y	Stock	Closure	Order Complete
27/06/2016	05:03	27/06/2016	10:52	05:49	aa	Customer	name		Stock	Closure	Breakdown - No deliveries today. S3049 can go to FMAP as A49
29/06/2016	07:37	1/07/2016	15:00	55:23	aa	Customer	name		Stock	Priority	MS:Priority - A374,K374,K744
1/07/2016	07:31	1/07/2016	15:00	07:29	aa	Customer	name	Y	Stock	Closure	Order Done
1/07/2016	07:32	1/07/2016	15:00	07:28	aa	Customer	name		Stock	Request	MSch:Send M20377 to the Mt as K374
1/07/2016	09:41	1/07/2016	09:41		aa	Customer	name		Stock	Request	MS:Can go over
1/07/2016	14:40	5/07/2016	15:00	96:20	aa	Customer	name	Y	Repairs	Repairs	SH:Loader out Mon & Tue next week

## Performance Reports

The table below shows an example of some of the detailed analysis that comes from the WSX system.

### Truck - Crew Arrival and Loading

Crew	Log Org	Arrival Time	Trucks		Loading Time Per Truck (minutes)						Average	
			Planned	Total	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60		60 +
xxxx	Combined	03:00 - 04:00		1						1		00:51
		04:00 - 05:00		8		2		3	1		2	00:48
		05:00 - 06:00		10		4	2	2			2	00:29
		06:00 - 07:00										
		07:00 - 08:00		7	1		1	2	2		1	00:40
		08:00 - 09:00		6				3	1		2	00:53
		09:00 - 10:00		8				1	1		5	01:21
		10:00 - 11:00		5			2	2			1	00:45
		11:00 - 12:00		5		2	1	1			1	00:57
		12:00 - 13:00		5	1	1	1		1		1	00:32
		13:00 - 14:00		8			3	1		1	3	00:52
		14:00 - 15:00		5						1	4	01:15
		15:00 - 16:00		5					1		4	01:15
					73	2	12	9	15	8	1	26

The System also provides customizable reports on truck utilization details, as shown below.

**Trucking - Utilisation (By Truck)**

Contractor	Truck	Truck Type	Log Orig	Trips	Days Work	Km Loaded	Km Empty	Loads/Day	% Loaded	Avg Load	Tonne/Day	Journey Hrs	Adj Hrs	Avail Hrs	Util %	OT Hrs	OT %	Total Tonnes	Tkm
Bobby	5524	MLTI	Combined	2	2	451	204	1.00	68%	225.50	30.81	11.70	11.70	28.00	41%			61.68	13895
	5597	MLTI	Combined	41	16	3906	3304	2.56	55%	95.27	76.45	196.20	196.20	224.00	87%			1223.20	116464
	5598	MLTI	Combined	11	11	1911	748	1.00	71%	173.73	32.56	58.00	58.00	154.00	37%			358.16	62223
	5600	MLTI	Combined	51	19	5541	5251	2.68	51%	108.65	78.40	302.40	302.40	266.00	113%			1489.51	165892
	5601	MLTI	Combined	60	22	6148	5751	2.73	51%	102.47	78.37	384.60	384.60	308.00	124%			1724.10	177638
	5602	MLTI	Combined	52	21	5341	4862	2.48	55%	102.71	75.86	258.60	253.00	294.00	86%	7.7	3%	1593.10	163855
	5603	MLTI	Combined	57	21	5586	5248	2.71	51%	98.00	77.73	329.30	329.10	294.00	111%	6.0	2%	1632.34	168144
	5604	MLTI	Combined	63	22	6236	6291	2.41	54%	117.66	76.79	310.40	307.40	308.00	99%	3.7	1%	1680.37	198550
	5605	MLTI	Combined	43	21	4600	3929	2.05	53%	104.65	65.71	236.80	234.10	294.00	79%	1.2		1380.00	144386
	5606	MLTI	Combined	3	3	411	344	1.00	54%	137.00	28.43	28.70	28.70	42.00	68%			85.30	11645
	5607	MLTI	Combined	26	17	4341	3794	1.53	53%	166.96	49.19	210.80	210.80	238.00	88%			836.22	139340
	5610	MLTI	Combined	12	12	1953	1217	1.00	61%	162.75	28.96	62.90	62.90	168.00	37%			347.48	56512
	5614	MLTI	Combined	20	15	1507	1235	1.33	54%	75.35	38.57	87.90	87.90	210.00	41%			578.56	43547

The foregoing is an indication of the analysis that is possible with detailed logistics information. The exact form of analysis cannot be finalized until the nature of the data captured is reviewed, e.g. an analysis of production may be just as meaningful on a daily basis as weekly.

A key feature of the WSX system is the operational visibility that it provides via a website. Whether this functionality should be shared with participants during the benchmarking phase of the Pilot needs to be considered carefully, as it may alter behavior and jeopardize the “business as usual” context.

## 7. SE US Log Trucking Business Operating Environment - Industry at a Tipping Point

The contract logger/suppliers and truckers attending the meetings held by the project team aired significant concerns about the adverse impact on their businesses of (low) trucking rates, driver/contract trucker shortages, insurance costs and highway regulations. Virtually all of the contractors that met with the project team considered that the rates paid/set for hauling timber were too low and that logging subsidized trucking. The impression was that the combination of challenges to efficient timber trucking posed a very serious threat to the viability of many logging and trucking businesses.

The industry associations are trying to help resolve some of the trucking issues but progress has been slow. There appears to be an opportunity for the Endowment and Sponsors to add their support to initiatives that can improve the timber trucking situation, particularly in relation to regulations.

### 7.1. Trucking Cost Information

Businesses operating within any commodity supply chain are all affected by “operating environment” factors such as changes in final demand, energy prices, regulations, labor market dynamics, insurance requirements and regional infrastructure conditions. Individual operators, however, will often experience distinctly different market and competitive conditions within their segment of the shared supply chain.

Timber processing industries span an extremely broad operating environment, from growing timber to finished wood and paper products. Every step of the timber supply chain is dominated by the costs and logistics of moving fiber. In 2006, US timber transportation costs commonly represented 15-20% of delivered log costs. By early 2015, this had risen to 25-30% in many wood baskets. In the lumber industry, for instance, timber transportation costs now exceed lumber manufacturing costs for many companies.

Given the significance of timber transportation costs to both suppliers and consumers of timber, there is a surprising lack of information on trends in timber trucking costs and their components. Regular reporting of timber trucking costs, in a similar form to those of The American Transportation Institute’s annual survey of highway trucking cost trends<sup>1</sup> could provide a sounder basis for planning and setting the cost/price of timber transportation in the industry.

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<sup>1</sup> American Transportation Institute

Table 9: Average Marginal Costs per Hour, 2008-2014

Motor Carrier Costs	2008	2009	2010	2011	2012	2013	2014
<i>Vehicle-based</i>							
Fuel Costs	\$25.30	\$16.17	\$19.41	\$23.58	\$25.63	\$25.78	\$23.29
Truck/Trailer Lease or Purchase Payments	\$8.52	\$10.28	\$7.37	\$7.55	\$6.94	\$6.52	\$8.59
Repair & Maintenance	\$4.11	\$4.90	\$4.97	\$6.07	\$5.52	\$5.92	\$6.31
Truck Insurance Premiums	\$2.22	\$2.15	\$2.35	\$2.67	\$2.51	\$2.57	\$2.89
Permits and Licenses	\$0.62	\$1.15	\$1.60	\$1.53	\$0.88	\$1.04	\$0.76
Tires	\$1.20	\$1.14	\$1.42	\$1.67	\$1.76	\$1.65	\$1.76
Tolls	\$0.95	\$0.98	\$0.49	\$0.69	\$0.74	\$0.77	\$0.90
<i>Driver-based</i>							
Driver Wages	\$17.38	\$16.12	\$17.83	\$18.39	\$16.67	\$17.60	\$18.46
Driver Benefits	\$5.77	\$5.11	\$6.47	\$6.05	\$4.64	\$5.16	\$5.15
<b>TOTAL</b>	<b>\$66.07</b>	<b>\$58.00</b>	<b>\$61.90</b>	<b>\$68.21</b>	<b>\$65.29</b>	<b>\$67.00</b>	<b>\$68.09</b>

The above table shows insurance costs increased by 30% from 2008 to 2014, while overall costs rose just 3%. These cost trends for “Over the Road” trucking probably understate changes for timber trucking, particularly for insurance costs, which continue to rise rapidly<sup>2</sup>.

## 7.2. Federal and State Regulations

State and intrastate heavy truck weight limits are inconsistent to the point where the best roads (interstate highways) are avoided and trucks must often reduce payloads to cross state lines. For several states in the US South, trucks carry 10-20% less than their potential payloads and the poor condition of rural bridges threatens to further lower weight limits in places.

Little progress has been made in improving weight regulations despite a number of logging association led efforts and the timber industry having allies in state and national agriculture and mineral industries. There is an opportunity for the Endowment and Sponsors to get behind the efforts of timber industry associations to advance more rational highway weight limits to the benefit of the entire timber supply chain.

## 7.3. TeamSafeTrucking

Insurance costs have more than doubled during the last decade for many logging and timber trucking companies. The project team heard first-hand of massive injury settlements fueling insurance company rate increases as a result of South Carolina’s well-intentioned injury arbitration law.

An increase in log truck accidents nationally has resulted in insurance companies lifting the minimum levels of experience required for new truck drivers to 2 years in many cases. This is making it even more difficult to ease the shortage of drivers that many contractors face. One very promising initiative, which seems worthy of support, is the TEAM Safe Trucking program. This program is a joint effort on the part of insurance companies, logging associations and Forest Resources Association. The program is currently initiating vital research on the nature and causes of timber trucking accidents in the Southern US.

As of early 2016 there were an estimated 60,000 driver vacancies over all sectors nationally. Recent increases in the construction and road building industry activity has increased the shortage of drivers for southern log trucking companies close to centers of growth in housing, e.g. coastal S. Carolina.

<sup>2</sup> discussion with FMC Insurance Agency



## 7.4. Endowment Role in Improving Operating Environment

There is potential for the Endowment and the Sponsors to lead or support initiatives that can materially improve the operating environment for timber trucking. In particular, it is recommended that the Endowment:

- Meet with regional logging associations to explore the joint development of advocacy plans to address the various State and Federal truck weight regulation issues
- Meet with those behind the TeamSafeTrucking program to determine if and how it should be supported by the Endowment
- Investigate the opportunity for establishing routine surveys of timber trucking costs and its components with a party such as the Wood Supply Research Institute - there is scope to widen such surveys to logging costs and productivity factors.

## 8. Information Gathered at Meetings & Interviews

The Project team met with timber industry participants in Alabama, Georgia, South Carolina and North Carolina to ascertain their views on the form of a proposed “open platform” timber logistics Pilot. Meetings were held in Columbia SC and Montgomery AL, followed by interviews with selected parties, some of whom attended the meetings.

<b>Parties at Meetings &amp; Interviews</b>	
Contractor Meetings	Meetings held in Columbia SC & Montgomery AL, attended predominantly by Contractors and/or Suppliers
Contractor/Supplier Interviews	Interviews with individual loggers, timber dealers, truckers or industry people speaking from their perspective - these people/businesses sell contract services or timber supplies to timber companies.
Timber company Interviews	Interviews with business' that process timber and/or own timberlands - these parties buy timber supplies or services from Contractors and/or Suppliers
Project Team	David New, Steve Carruth & Paul Robinson

<b>Attendance at Meetings &amp; Interviews</b>		
	<u>Organizations</u>	<u>People Attending</u>
Meetings	22	30
Interviews	11	24
Phone Interviews	3	6
<b>Total Parties Engaged</b>	<b>36</b>	<b>60</b>
Contractor/Suppliers	28	
Timber Companies	8	

Total Interviews	18	<i>Incl. meeting attendees</i>
Total Phone Interviews	6	
	<b>24</b>	

The information gathered was put into 3 broad categories:

1. Background Information - matters that are part of the operating environment for a Pilot but not directly relevant to it.
2. Issue or Opportunity - matters that appear to be business operating environment issues for the industry but are beyond the original scope of the Pilot.
3. Pilot Consideration - matters that warrant consideration in relation to designing a Pilot

The information is further organized by topic within each of the 3 main categories.

## 1. Background Information - not directly relevant to a Pilot

### Context - Drivers Driver shortage

- Best drivers are predominantly older men. Poor work ethic in younger workers. - Contractor/Supplier
- Commercial Drivers Licence (CDL) require 2 years training before alone in truck - Timber company
- Crew members and drivers paid base salary + bonus. Drivers earn about same as skidder operator - they need to do 800-900 loaded miles per week. Drivers work 5am to 8pm, whereas skidder operator is 6:30am to 5pm + drive to and from work - so 15hrs with truck vs about 12 (incl. 1.5hrs travel to and from job) for logger. - Contractor/Supplier
- Drivers paid per mile or per load. 90% of our drivers are home every night, compared to long haul drivers away for weeks. So not too hard to get drivers for by-products. - Contractor/Supplier

### Context - Independents Operational performance issues

- Loggers will put up with independent truckers going off to do other work, even early in the work week, as they have no other options. Some owner-operators are go-getters. - Contractor/Supplier

### Context - Independents Trucking unprofitable

- Low cost truckers are small independents that don't tend to comply with equipment or operating standards of mid to large-sized suppliers. SFI initiative was supposed to drive higher compliance standards across industry. There was a Master Logger program. - Contractor Meetings
- Low cost, non-compliant truckers keep hauling prices lower than they would be without them. - Project Team
- Lowest common denominator sets truck rates. Cost 16c/ton mile but paid 13c. - Contractor/Supplier

### Context - Insurance

- No log book for hauling within 100 miles of tract and, therefore, cheaper insurance. - timber company

### Context - Insurance Insurance issues

- Need a DOT number to travel on Interstate highways; this relates to number of driving infringements on part of driver. No log book for Intrastate (<100miles), so no (bad) records affecting insurability. - Contractor/Supplier
- SC insurance \$16k (per year/per truck, presumably) and same in NC = \$3k - Contractor Meetings

### Context - Market

- A greater proportion of bigger loggers now and they have more bargaining power with mills. - Contractor/Supplier
- Business did 800,000 ton in 2007. Now 450,000 ton per year but a better profit. - Contractor/Supplier

- Business is predominantly Gatewood or Supply Agreements. Some long term, some day to day. Try to deal directly with loggers and avoid timber dealers but there are still some big dealers. Dealers are trying to carve out their role in the industry. Work with individual landowners to get supply. Procure supply delivered. Don't buy stumpage. - timber company
- Chip-n-saw market gone away - sawmills taking bigger logs. Small chip-n-saw logs going to pulp. OSB prefers older fiber. Overall pulpwood market situation is impacted by more demand for OSB & energy. Less hardwood (environmental) and more pine. - Contractor/Supplier
- CRP program (Conservation Reserve Program) has paid landowners to retire agricultural land to pine. Aim was to prop up corn and soy by taking marginal land out of supply. CRP led to a lot of new plantations. These had to be thinned to comply with program. All of that is now done with little new pulp plantation planting being done under CRP. CRP now only doing long leaf pine as it is regarded as more "natural" but it grows at half the rate. A lot of forest land is being lost to urbanization but losses offset by higher yields. - Contractor/Supplier
- Glut of sawtimber in South after robust thinning program and 10 years of poor demand, in the context of a 25 year rotation. Sawtimber selling for much less than 10 years ago. Fewer residual chips during recession, which resulted in more Roundwood being needed by pulpmills, which supported landowners' demands to thin. - Contractor/Supplier
- In 10 years' time there will be fewer mills and less labor, on current trends. - Contractor/Supplier
- Market for chip-n-saw disappearing. Large sawmills poised to expand if market lifts; will put new capital into mills and add shifts. - Contractor/Supplier
- Mill interruptions due to capital projects or heavy inventory - this year it was heavy coming out of winter. - Contractor Meetings
- Mills only want cheaper wood. - Contractor/Supplier
- Most mills (and their procurement staff) are too removed from supplier operations to understand what is really happening. - Timber company
- Mostly take delivered supply, perhaps 5% stumpage. - timber company
- Some suppliers get red carpet treatment from pulpmill, who are regarded as proxy mill dealers. They do mills' bidding and get preference on supplying. - Contractor/Supplier
- The majority of raw material is produced through purchase agreements with landowners, wood dealers and loggers. - timber company
- There is significantly more capacity to produce than 5 years ago. WSRI studies reinforce this but some other studies, e.g. PWC, suggested under-capacity? Most of the studies that predict under-capacity are based on a rapid ramp up of demand tied to a rebounding economy and potential difficulty in financing for the logging business sector. Also there are fears about a lack of new entrants into the sector due to changing labor demographics. - Contractor Meetings
- Typically there is a clearfell and a thinning price for Roundwood but piece size differences can result in material productivity differences. Pine pulpwood is in short supply so thinning age now down to 12-13 year (and smaller piece size). - Contractor Supplier

### Context - Market Quota impacts

- Competition from Asia and S. America has hurt mills. A lot of pulpmills disappeared 1997-2002 but loggers didn't go away, so oversupply. Mill procurement foresters only know an oversupply environment. Pulpmills don't need to commit on price or supply. Contractors continually hammered. Belief is that it is a commodity market that will balance itself. Could be over 1m tons of excess capacity in Al. - Contractor/Supplier
- Like other large dealer contractors, they are managing a dynamic woodflow of some complexity. - Contractor/Supplier
- Mills need to take advantage of low cost Gatewood to be competitive. - Contractor/Supplier
- Need just a cellphone and a pickup truck to be a wood dealer these days - the mill will take wood from anyone. - Contractor/Supplier
- Pulpmills closing or taking downtime because don't want to oversupply paper market, which is under competition from South America and Asia. Last winter was first time in 20 years that quota persisted all through winter - indicative of oversupply situation. - Contractor/Supplier
- Pulpmills don't want to hold inventory as aged fiber less desirable. - Contractor/Supplier
- Satellite yards (dealer-owned) tend to hold back supply to help sell on better terms in winter. - Timber company

### Context - Operating Environment

- Forest roads and operating conditions hammer the trucks, compared to OTR trucks. - Contractor/Supplier
- The wood using industry and resource can't change - any Pilot is in this context. Similarly, the infrastructure, legislation, industry people, equipment, safety rules etc. But what can change and be tested in a Pilot? - timber company

### Context - Pilot

- If loggers feel under siege from other issues, it's hard to interest them in a Pilot. Consumed by more fundamental issues than a little more production from their trucks. - Contractor/Supplier
- There are separated trucking programs operating in the South - so it can be done. - timber company

### Context - Practices

- Average haul 45 miles. Depot next to large mill and some drivers live near another large mill, so minimum deadheading. - Contractor/Supplier
- Drop trailers at mill for night delivery on occasion. - Contractor/Supplier
- Gain some help with home loads from mills. - Contractor/Supplier
- Loggers have to fix their own trucking problems - can't rely on others to provide the answer. - Contractor/Supplier
- Most logging companies are somewhat territorial and desire control of shipments. - timber company

- Only the largest companies are organized to increase loaded miles above 50%. - timber company
- Set-out trailers being used by some crews. Have a cost but result in more loads being hauled. One contractor using GPS to help dispatch trucks between its crews, which has worked. - Timber company
- Track haul routes and load destinations. - timber company
- Truck contractors go work on other jobs if they don't have work at their normal logger. - Timber company
- Trucks typically start at 4am to avoid line at mill and like to finish with a home load. - Contractor/Supplier
- Very seldom make a backhaul work. Everyone tries to short haul because trucking is expensive and short hauls mean less backhauls. - Contractor/Supplier
- When truck requirements change, contractor is able to move trucks to another crew because he can see where they are via a tablet showing the tracking (tablet in his truck). Operations are run for good of whole company but some competition between crews. - Contractor/Supplier

#### Context - Productivity

- All crews now need to (and can) produce and deliver 10-12 loads/day to pay for the gear. Crews were a lot less productive 4 years ago. So much production that can't fit wood into mills, even if mills running well! In an oversupplied market, suppliers will always be knocking on the mills door - ideal for mills. - Contractor Meetings
- Have 4 crews. Trucks do visit other crews, including for other loggers on occasion. Get about 45% loaded miles. - Contractor/Supplier
- Skilled and capable operations can produce day in day out, even if wet. Now cutting better timber (growth > drain) and can make up any wet weather losses in production. - Contractor Meetings

#### Context - Quota Quota impacts

- Constantly frustrated by unexpected quota curtailments. Mills take very strict line on quota as any latitude invites over-delivery. Often don't get quota for upcoming week until Sunday pm. Procurement blames the mill management - seems to be a lack of internal communication. - Contractor/Supplier
- Even if a large Timberland owner has 20% of supply to a big pulpmill, that is not enough leverage to really get support on taking production with less restriction. - Timber company
- Feb-May is a wet time of year and when pulpwood has traditionally been more expensive. However, pulpmills now tend to have maintenance shutdowns over this period and there is not enough pulpwood market = too much supply capacity at this time. - timber company
- Friday estimate of next week's order. Order may be < supplier capacity. Supplier motivated to produce early in week to avoid being shutout at end of week ... before supplier's quota is delivered. - Project Team
- Have to be very careful not to overcommit stumpage but need some in front to keep operating. - Contractor/Supplier
- If local mill has enough wood to get through its winter maintenance shutdown on Jan 1st, then the price for pulpwood will be cut. Back in 2000, mill owned timber

and contractor was a preferred supplier, and was paid \$1/ton premium. - Contractor/Supplier

- Mill can provide plan for supplier for up to about 2 months but it takes about 6 months to buy stumpage and put in place cutting etc. Capacity is “melting” away as quota cuts impact. - Contractor Meetings
- Mill cutbacks mean crew that could do 15 loads/day is doing 9 loads = quota and some trucks are idle. - Contractor Meetings
- Mill quotas = holdups = truck and crew downtime - Contractor Meetings
- Need a quota allocation from mill to be able to buy timber. Plenty of instances where tracts are purchased on current price and then mill cuts the price. Some suppliers get a 30 day price and some a floating gate price. - Contractor/Supplier
- Quota cutbacks impact mainly those supplying on a day to day basis - steadier for longer term suppliers. Long term arrangements mean greater commitment on part of both parties. - timber company
- Quota restrictions impact on timber hauling 70% of the time. - timber company
- Solid wood mills buy from everyone. They can be more difficult to supply than pulpmills, and often shutdown on Friday. - Contractor/Supplier
- Supply volume to pulpmills may be an overall planned volume at a price but not fixed weekly - mill may have no fixed order or price for much of year. Mill will contract for a quantity and price in Fall to build inventory for winter. - Contractor/Supplier
- The overcapacity situation manifests itself by loggers having to cut and cart extra timber at the start of the week to beat the end of week quota cut-off - have to have capacity of both logging and trucking that can overproduce at start of week and is then underused later in week. - timber company
- This week there are no pulpwood deliveries on Friday and the delivered price will be \$1/ton less from Monday - which is typical of an impossible operating environment. Sawmills tend to be easier to deal with. - Contractor/Supplier
- Trucking stops once quota met or mill shuts off deliveries. This results in logging becoming quickly jammed up. No guarantee of next week’s order so logging tends to stop soon after hauling as risky to build stock in woods. - Project Team
- Wet season is from Fall to March. Get specific volume and price order for that period on pulpwood. - Contractor/Supplier

#### Context - Regs Regulation impact

- Operations are being retooled and have a lot of production capacity. DOT regulation motivating better trucks and driving practices. - Contractor Meetings

#### Operation configuration - Market

- Most loggers have a few of their own trucks with contractors to cover the peak periods. - Timber company
- Most truck contractors are owner-operators with 1-2 trucks. - Contractor/Supplier
- The custom nature of log trucks means that their availability is limited if demand spikes, compared to the greater availability of OTR trucks. - timber company
- Trucking is either owned or contracted by the logging companies. - timber company

### Operation configuration - Practices

- Contract loggers run their own trucks. Most have 1-3 trucks they own and 1-2 contract trucks. Contractors rarely work in with other crews on sharing haulage. - Contractor/Supplier
- From a logger's perspective, trucks are necessary to get timber off the job site but loggers don't have a great interest in running trucks for their own sake. - timber company
- Some loggers have had negative experiences with unreliable contractors and therefore feel the need to own trucks to reduce risk of non-performance. - timber company

### Participants - Contractor Different haulage model

- Large contractors get haulage productivity benefits from large scale and diversity of operations. It is the contractors' competitive advantage. Would like to see these contractors expand their networks but they might not want to share their current advantage. - timber company
- Large haulage contractor is a very entrepreneurial business involved in haulage and all sorts of other things - timber company

### Participants - Market

- Used to have 6 different paper companies and a lot more loyalty to suppliers; now fewer pulpwood customers in most places. - Contractor/Supplier

### Participants - Productivity Different haulage model

- One enterprising truck contractor calls other crews for a load when he sees a backload opportunity but it sounds like trucks mostly stay with crews. - Contractor/Supplier

### Protocols - Practices

- High production contractors do not want to inventory logs in the woods. - timber company
- Many of the contract haulers work for more than one logging company. - timber company

### Protocols - Quota

- Gatewood is hard to certify - a barrier to using it. - Contractor/Supplier
- Permitted to drop trailers at mill during the day and use a yard truck to shuttle these in at night. Gets some kind of priority at customer but has no alternative markets and can't go elsewhere if customer is closed. - Contractor/Supplier

### Protocols - Roads

- Maintaining roads is a challenge to haulage logistics. - timber company

### Scope - Cost

- Trucks mostly attached to 1 crew - too hard to dispatch over 5 crews, would need an extra person to do that. - Contractor/Supplier

### Scope - Market Quota impacts

- Some mills are more reliable with wood orders. Some tend to commit to plans and work with us, e.g. allow loads on Saturday on occasion. - Contractor/Supplier



### Scope - Past Initiatives

- Did route modeling project several years ago. Showed potential for separated trucking but too many practical issues. Have focused on improving turn times instead. - Timber company
- Involved in past GPS tracking initiative. Tried dispatching separated trucks but didn't work - may have been the person involved. Most drivers have been owner-operators so motivated to make it work. - Contractor/Supplier
- Less deadheading would be good but separated trucking has been tried by different logging companies and didn't last because mill controlled deliveries and these are often shut off without warning. - Contractor/Supplier
- Truck separating initiative described as a disaster. - timber company

### Scope - Practices

- Contractors can work largely without quota if demand is controlled to allow the supply system to run at full production. - Timber company
- Dropping trailers at the mill - logger provides the spotting truck to move trailers at night. Requires 3 extra trailers per truck but "at least it gets the timber out of the woods". - Contractor Meetings

### Scope - Productivity

- 17-18 min turn time at mill but longer in queue so dropping trailers for unloading at night is helpful. - Contractor/Supplier

### Technology - Pilot

- There are Uber-type Apps for OTR trucking. One of these is [www.dat.com/load-board](http://www.dat.com/load-board) - Contractor Meetings

### Technology - Practices

- Run on-board scales. Try to use lighter trailers. Have good safety record and low insurance. Yet trucks subsidized by logging. - Contractor/Supplier

### Technology - Tech

- Drivers are incentivized not to speed (GPS checks). Fuel consumption lower with GPS - more use is made of cruise control. - Contractor/Supplier
- GPS on trucks is throwing money away. Better turn times at mill is key to better utilization. Reducing shutouts on Thu & Fri would really help. More visibility of upcoming demand/orders would help. - Contractor/Supplier
- There are some, but very few trucks that utilize GPS or trailer scales. - timber company
- Truck scales have value but not GPS. - Contractor Meetings
- Truck tracking is important. - timber company
- Have GPS tracking - insurance requirement. - Contractor/Supplier

### Context - Operational Configuration

- Contractors do own trucking - they own about 75% of their trucks. - timber company
- Most trucks are logger owned, with haulage supplemented by a few independent trucks - timber company

### Scope - Operational Configuration

- 17 chip vans run with 10-11 trucks and 14 log trucks that don't spot trailers. - Contractor/Supplier
- 18-26 trailers spotted at mill for 14 chip trucks. - Contractor/Supplier
- 5 logging trucks + 6 trailers (1 spare) for one logging crew. - Contractor/Supplier
- Chipping crew consists of 3 x Feller Bunchers + 3 grapple skidders + 2 chippers. - Contractor/Supplier

### Context - Admin

- Multi driver loads present tracking and accounting challenges - Contractor Meetings

### Context - Cost

- Negotiate timber supply prices based on costs and hauling cost is 1/3rd, so of importance - Timber company
- New trailer costs \$25k and tractor unit \$135k. - Contractor/Supplier

### Context - Drivers Insurance issues

- All drivers paid salary plus bonus. Business has worked out a sophisticated bonus scheme, which resulted in many extra loads hauled in first month after introduction. But insurance don't like incentives as they feel it encourages speeding etc. - Contractor/Supplier
- Contractor pays drivers by the hour and uses GPS to track performance. - Project Team

### Context - Industry

- Current contractors are survivors and very good at what they do. - timber company
- SE Wood Products Assoc. are meant to be a logger oriented organization but tend to be funded by mills and focus on legislation issues. - timber company
- Southern Loggers Coop members pay for fuel weekly basis = frequency of payments to landowners, drivers and suppliers (by mills). - Contractor/Supplier
- SWPA is a good body for promoting industry interests - timber company
- WSRI was meant to be an opportunity for mills and loggers to progress together. WSRI was established on premise that everyone has to win. - Contractor/Supplier

### Context - Market Capacity shortage

- High oil price put many independent truckers out of business but they are doing better now and more are coming back into the industry. If independents can be brought under a group of loggers, this may offer them more regular work and help with professionalism and insurance? Vast majority haul for the same crew 80-90% of the time. Most lack ambition. - timber company
- Limited truck availability is generally a temporary issue, but there is no doubt that more efficient management would increase equipment productivity. - timber company

### Context - Market Operational performance issues

- Dealers are saying “please take hauling off my plate”, too much hassle. - timber company

Context - Pilot Capacity shortage

- We haul to closest mill where we can get unloaded, compared to sending truck far away to mill providing better return on timber - can’t afford to have truck away from job for too long - Contractor Meetings

Context - Practices Capacity shortage

- Ability of logging companies to switch from delivering from short-hauls to long-hauls effectively. - timber company

Context - Practices Different haulage model

- Dispatch truck fleet and monitor very carefully to keep track of deliveries relative to quota and to get ticket reconciliation done. - Contractor/Supplier
- Puts trucks to each crew, who manage them. When quota is done at one crew (near end of week), a truck may shift to help another crew. But trucks largely stay with a particular crew. - Contractor/Supplier
- Would contemplate using a big contractor to provide all trucks but they would still work as currently, i.e. tied to a crew. - Contractor/Supplier

Context - Practices Operational performance issues

- Delays both at the mill and in the woods are issues that negatively impact productivity. - Timber company
- Run 2 times as many trailers as trucks, to enable trailers to be dropped at mill or crew so truck can turn faster - otherwise very slow. Biggest timber hauling issues are inconsistency of mills, crews and people (drivers). Most mill staff (union or otherwise) don’t care about impact on trucks. - Contractor/Supplier

Context - Productivity Different haulage model

- Trucking by 3rd party is working well with the loggers relatively happy. Would like the trucking to be a bit more profitable to earn enough to pay the right drivers. - timber company

Context - Productivity Operational performance issues

- Consider that there is 20-30% excess capacity in the system to manage cost and supply. Impact on logging is much greater than on trucks. - timber company
- Trucks average 40% loaded. Everything cut here goes either E or W; there is minimum backhaul potential. Sometimes trucks only manage 2 loads/ day at 35 mile haul because of holdups at mill. Need too many trucks for a logger to be productive. - Contractor/Supplier

Context - Quota Improvement opportunities

- Contractor has installed and operates materials handling at processing site, which has run very well. - Contractor/Supplier

Context - Quota Operational performance issues

- Finance company default rate on equipment is 0.5% in SC but 2% in AL. - Contractor/Supplier

Context - Quota

- Big issue is mill staying full over winter, so quota hangs over production. In situations where mill inventory is low, mill pays premium for distant supply to stop local dealers increasing price. - Contractor/Supplier
- Contractor gets support from mill (a price to work with) to book stumpage up to 2 years out. - Contractor/Supplier
- Some oversupply situations are due to a fall in mill consumption, e.g. rebuilds, outages. Some due to increase in production of logging/ trucking operations - investment in great equipment. Some due to high volume timber stands following undercut during the Great Recession. Hard to get good info on future demand from mills. Appears to be (at least for now) a mismatch of supply: demand - how to coordinate that mismatch. Need win/win/win mentality - shared risk. - Contractor Meetings
- Stumpage purchased on lump sum and per ton, where landowner takes volume and mix risk. Used to have 9 months of timber purchased; now happy with 2 months. - Contractor/Supplier

#### Context - Regs Capacity shortage

- eLog requirements from Dec 2017 may hit trucking capacity - legal hours = 14hrs, incl. 2 x 30min breaks. - Contractor/Supplier

#### Context - Roads

- 90% of timber within 5 miles of state highways. - timber company

#### Context - Weights Compliance issues

- Some mills strictly enforce weight limits but varies from mill to mill. - timber company

#### Context - Weights Regulation impact

- Short term issues are the road restrictions on weight and lack of proper rules based on axle configurations. - Timber company
- Virtually all hauling is on state highways as standards for using Interstate highways are too difficult to meet. Interstate limit is 80k pounds with limits on individual axle weights. State roads are 84k and 88k pounds in GA and AL with no axle limits. In NC, extra axle enables higher weight but is typically in form of hydraulic retractable wheel, which wears tires excessively. - timber company

#### Context - Capacity

- 2 years ago not enough loggers but now too many. A study at the time predicted larger loggers would add capacity to address any shortage - this has happened. - Contractor/Supplier
- More productive logging gear has exacerbated over-capacity yet should potentially improve unit costs of production. - Project Team
- Surge in demand could be met by bigger loggers adding capacity - not a great risk now. May have to raise rates a little to stimulate. - timber company

#### Context - Cost Trucking unprofitable

- Haulage rate is 13c/t mile. - Contractor/Supplier
- Ideal job is <40 miles haul, at which distance the rate is usually fixed. Long hauls can also work. - Contractor/Supplier

- Log trucking not economic most years. Turn down a lot of log truck hauling enquiries. - Contractor/Supplier
- Make money logging, not trucking. Log trucks get similar \$/mile as OTR trucks, which have it much easier. - Contractor/Supplier
- Over the road (OTR) trucks operate at 12-14c/ton/mile. - timber company

#### Context - Market Trucking unprofitable

- On occasion, the buyer with excess power will need to encourage its most marginal suppliers to keep going, but this will be a short-term situation. Low prices for timber, trucks and drivers will not attract new entrants into the industry but if there is a surplus of logging capacity, then new entrants are not required, i.e. even with driver and truck shortages, the loggers say they can produce a lot more. It is only the quota that is holding them back. - Project Team
- Relative power of buyers and suppliers may explain a lot of what is going on. In a market where a buyer has a near-monopoly and the supplier force is fragmented, the timber price will tend to be lower than in a more competitive market. Some form of buyer power superiority is probably also helping to keep haul rates and driver wages low, i.e. many small independent truckers and drivers are non-union. - Project Team

## **2. Issue or Opportunity**

#### Context - Admin Regulation impact

- It takes 80% of a person's time to do paperwork for 8-10 trucks to run interstate. In addition, there are 4-5 days/ year for audit consultant to meet compliance. - Contractor Meetings

#### Context - Drivers Driver shortage

- Average age of drivers is 60 years. There is a local car factory that offers steady work; something you don't get driving log trucks. - Contractor/Supplier
- Biggest issue for contractor with 6 crews and 33 trucks is finding drivers - has had only 2 applications all year. - Contractor/Supplier
- Biggest issue is supply of truck drivers. - timber company
- Driver availability may be a larger issue as driver compensation seems to be better in other industries and driver's logbook restrictions are tightening. - timber company
- Driver earnings impacted by delays at mill and in woods. More delays = less pay = less attractive job. - timber company
- Drivers paid on production but mills hold them up and they can't make a living. Increase in Health Insurance costs (employee pay share) offset pay raises given to drivers. - Contractor/Supplier
- Important issues for the long term are driver pay, quality of drivers and quality of equipment. Forestry work is tough and increasingly hard to get people to work in such conditions. - timber company
- Industry recycling drivers looking for better pay on next job. - Contractor Meetings
- Insurance companies may accept Veterans without the wait? Establish website to attract Vets to log truck jobs. - Contractor Meetings

- It takes 2 years in the jump seat to qualify a driver. If you have 1 wreck, it adds \$16k to next year's insurance. 2 year wait eliminates young drivers. - Contractor Meetings
- Log truck driving is seen as worst job. Need to pay decent wages and work better hours to compete with OTR work. - Contractor Meetings
- Many trucks parked for lack of drivers. - timber company
- National driver shortage is 50,000 now and forecast to be 200,000 in 5 years. - Timber company
- Payment for trucking almost always a piece rate or production bonus. Lost time queuing or lost loads due to being unexpectedly shut out from mill results in insufficient income for drivers, who look for work elsewhere. - Project Team
- Truck drivers hard to find. Tend to chase better pay in oil and gas. - timber company

#### Context - Equipment Operational performance issues

- Condition of trucks & trailers have improved with lower fuel prices, but there may be more efficient equipment available than what we currently utilize. - timber company
- Other issues include the age of truck equipment because many are "throwaway" OTR trucks. Yet the rates paid for timber do not cover the cost of good equipment. - timber company
- The priorities, in order, are fixing the equipment, the legislation and operational efficiency - timber company

#### Context - Independents Operational performance issues

- An independent driver can acquire an old OTR truck for \$26k + \$2k for an old trailer and be up and running - rig will typically be too heavy compared to custom logging units - timber company
- Independents have to get up to standard as industry is changing so much or they will otherwise get left behind - Timber company

#### Context - Independents Trucking unprofitable

- Small contractors struggle to pay income tax etc. - Contractor Meetings

#### Context - Insurance

- The TeamSafeTrucking scheme is important. Ideally drivers are ready to be insured on day 1 rather than after 2 years. Scheme needs to give insurance companies confidence to keep insuring trucks. - timber company

#### Context - Insurance Compliance issues

- Level 3 DOT compliance requirement would knock trucks off the road. - Contractor/Supplier
- Public afraid of log trucks on road. Raggedy owner operator trucks create bad impression. Law enforcement are sympathetic to independents and turn a blind eye! Owner-operators don't all have workman's comp. - Contractor Meetings

#### Context - Insurance Insurance issues

- Insurance is a big issue. Underwriters don't need to write log truck insurance. It will get worse. Need to have a perfect record to get and retain insurance. - timber company
- Insurance is a nightmare. Paying over \$700k per year. Potential to cooperate in purchasing insurance. - Contractor/Supplier
- TeamSafeTrucking - program aimed at insurance companies to get reasonable insurance terms. Will involve GPS tracking. 34 insurance companies have quit insuring log trucks because of accident rates. - Contractor Meetings

#### Context - Insurance Operational performance issues

- Accidents due to production pressure and driver burnout - Contractor Meetings

#### Context - Market

- Biggest issue is Dealers making margin with no skin in the game = greed. As soon as log haulage becomes efficient, the mill will want any gain. Dealers are mostly traders using other crews. Very poor communication from mills on demand changes. - Contractor/Supplier
- Market should be solving the logging overcapacity problem - loggers should be leaving the business and/or parking gear. - Project Team
- Not enough 3rd party haulage. - Contractor Meetings
- Southern Logger Coop (SLC) has over 100 small trucking firms using 30+ fuel depots across South. So there is an existing precedent for cooperating. - Contractor Meetings

#### Context - Market Quota impacts

- Accounting and engineering people are in charge of wooding mills now and lack the understanding of foresters. Timber is being treated increasingly as a pure market commodity with little interest in how it gets to market on the part of mills. - Project Team
- Mill management and procurement people on different page. Mill folks don't care about supply issues. Mills need to truly understand trucking. - Contractor/Supplier
- Mills cut price whenever wood inventory is high and suppliers are clamoring to deliver timber. Instances of price cuts leading to suppliers producing more timber to offset reduction in unit price. Price cut may result in short term supply increase from existing suppliers but will not bring new capacity to the market - it may eventually bust the existing suppliers and reduce capacity. - Contractor Meetings

#### Context - Productivity

- Mills intent on keeping cost low. Some mills don't appreciate how important logger production rates are in keeping costs low. - Contractor/Supplier

#### Context - Quota Quota impacts

- There is a piece missing in supply system - can't predict demand issues before they become a problem. Suppliers continually blindsided. - Contractor Meetings

#### Context - Regs Regulation impact

- Costs from regulation/ record keeping, e.g. e-log - Contractor Meetings
- Issues include barriers to using the Interstate network. - timber company

#### Context - Regs Trucking unprofitable

- The industry is programmed to break the law. Need to overload and speed to make a dollar. - Contractor Meetings

#### Participants - Capacity

- Other loggers don't want long hauls because they can't get extra trucks to handle these - so if they did them they would lower logging output. - Contractor/Supplier

#### Protocols - Quota

- Mill has production outlook for at least 6 months out and there must be a corresponding timber needs forecast to fit mill production plan. - Project Team
- Very little communication on inventory (mill or woods) or production or expected mill consumption. - Contractor Meetings

#### Scope - Past Initiatives

- Trucking is the biggest challenge for loggers. Average haul can go from 30 to 60 miles, which causes capacity challenges. - Contractor Meetings

#### Context - Drivers Insurance issues

- Could cooperate on health insurance for drivers. - Contractor Meetings



#### Context - Quota

- Some mills pay premium for wood beyond normal wood basket, in order to keep mill topped up. Mills keep supply at 125% of needs so that everyone operates at “just above broke”. - Contractor/Supplier

#### Context - Weights Compliance issues

- State DOT not enforcing its rules, e.g. overloading. Mills are also not enforcing in many cases. Loggers increasingly using scales to ensure they comply on weight - but their attorney says using scales could get them in more trouble if they overloaded because then it would be done knowingly! A lot of independents shoot for 95,000 lbs to get just under mill max of 96,000 lbs, versus 88,000 lbs legal limit. - Contractor/Supplier

#### Context - Weights Regulation impact

- Key issues that Endowment might help with: weight restrictions with respect to Interstate Highways (weight limits too low), bridges (many may have maximum loading reduced?) and state highway (road conditions and weights). - timber company

#### Context - Market Driver shortage

- Inconsistencies in work mean it is difficult to provide work for new contractor or driver. - Contractor Meetings

#### Context - Pilot Compliance issues

- Risk exposure - The log truck/driver is the ambassador to the public (good or bad) for each logging operation. - timber company

#### Context - Pilot Quota impacts

- Mills need to make commitments on volume & timing - Contractor Meetings

#### Context - Productivity Improvement opportunities

- If less capacity required = fewer machines = fewer operators, who are aging. - Timber company
- Interested in secure yards near mills or woods for dropping and swapping trailers - needs to be secure as they have had new trailers stolen. Local mill will often stop taking deliveries and extra trailers enable trucks to drop these at gate. - Contractor/Supplier
- Would like to see mills have satellite log and chip yards to hold surge capacity. - Contractor/Supplier

#### Context - Productivity Regulation impact

- Ex-logger claims 2 biggest opportunities are making regulations more friendly to log haulage and getting more back hauls. Back hauls could increase truck income by 30-40% on some days - timber company

#### Context - Regs Driver shortage

- Introduction of slog (electronic log books) may result in 8% more truck capacity being required. Drivers paid on a \$/t hauled will earn less working the shorter (regulated) days. - Contractor Meetings
- Regulations on Weights and Insurance (hampering driver recruitment) are “50%” of the issues. - timber company

#### Context - Regs

- Need horsepower of big companies to change the law. - Contractor Meetings

#### Context - Roads Regulation impact

- Hauling interstate requires IFTA tags and compliance, which is a disincentive. IFTA tags important when logging close to State boundaries. - timber company

#### Context - Tickets Improvement opportunities

- Would like to see industry standardize scale tickets, including barcodes etc. to make reconciliation less than impossible. Noted that it takes loader operator 5 min to write a load ticket = a lot of time over a day. - Contractor/Supplier

#### Context - Weights Improvement opportunities

- Weights are the biggest issue. A 10% increase would have a big cost payoff. Limits in Canada are to 144,000 pounds - timber company

#### Context - Weights

- Weight laws need to change. Adding a 6th axle should enable higher weights. - Contractor Meetings
- Weights - Political solution at state & federal level - Contractor Meetings
- Would like the Endowment to put its energy into helping sort out truck weight limit issues. - Contractor/Supplier

#### Context - Cost Trucking unprofitable

- Logging subsidizing trucking. - Contractor/Supplier
- No one is investing in trucking other than to service their own crews. Rates too low; recent example of hauling export logs and rate significantly better than equivalent haul to pulpmill. Would have invested in more trucks if it were profitable. - Contractor/Supplier
- Not paid enough to get decent trucks. - Contractor Meetings
- Over the years, trucks have become more expensive relative to logging. - Contractor Meetings
- Rate for hauling chip same as 10 years ago. Now need to provide health insurance for drivers - added cost. - Contractor Meetings
- Truck company loses money but necessary to make money in logging. - Contractor/Supplier
- Trucking is a necessary evil. Contractor at meeting hit nail on head when he said there was no way it was worth hauling for someone else. - Contractor/Supplier

- Trucking is subsidized by logging. Rarely see a profit in trucks - only if backhauling. Most crews feel they subsidize trucks. They have to run trucks because they can't rely on 3rd parties. - Contractor Meetings

#### Context - Independents Compliance issues

- Bad apples give bad name to industry - comment aimed at small independent truckers - Contractor Meetings
- Independent truckers slip past DOT audits. Work for below cost rates. Have high accident rates, which affect everyone's insurance. - Contractor/Supplier

#### Context - Independents Insurance issues

- Smaller companies have the highest accident and insurance rates - coop could help. - Timber company

#### Context - Pilot Trucking unprofitable

- Breakeven or profit in trucking only when backload opportunities happen. - Contractor Meetings

### **3. Pilot Consideration**

#### Context - Insurance

- If hauling for other loggers, they require a copy of insurance. - Contractor/Supplier

#### Context - Insurance Insurance issues

- DOT regulations - Principals are responsible for any unmet liability, i.e. landowners are for suppliers, who are in turn responsible for contracted trucks. Need to keep records for contract trucks as if employees, e.g. hours, drug tests. So when a truck goes to another job, that logger has to keep extra records (to comply) and have additional insurance (that is not easy). Even if you lend a trailer to another logger, you are responsible if it fails and causes an accident. Mills are listed as additional insured on supplier policy. Normally only get 10 days' notice if an independent contractor cancels its insurance. - Contractor/Supplier

#### Context - Op. Env. Capacity shortage

- Mill hours an issue. Log yard open from 7:30am to 4:30pm. Trucks often loaded overnight to make max use of delivery window. - Contractor/Supplier

#### Context - Practices

- Mills have to facilitate flow & turnaround of trucks by managing receiving, using inventory to buffer surges, planning delivery levels and being supplier and drive friendly. - Contractor Meetings

#### Context - Quota Quota impacts

- Sawmills micro-manage their production and therefore must have similarly tight control over wood supply - don't hold much inventory. Weekly demand fluctuations is a major hurdle for any wood supply model. - timber company

#### Criteria - Pilot

- As a Pilot may show potential for, or demo, a productivity gain, the mills will try and use that info to cut rates. This is a big risk of participating in a Pilot. - Contractor/Supplier

- Likes the idea of benchmarking before a Pilot. - timber company
- Pilot analysis could be done by WSRI, who can publicize (FRA can also do this). - timber company
- Pilot vision should be to work out what can be done to improve the wood supply system? - timber company
- Success of a Pilot = lower delivery costs or more profit for someone - Contractor Meetings
- The key test of a successful Pilot is in how well it services the uplift needs of loggers. - timber company
- WSRI should do a study on harvesting as well as transport. - Timber company

#### Location - Pilot

- Central AL might be a good wood basket for a Pilot as many of the sponsors have facilities around there. - Contractor/Supplier
- Pool demand and supply for Pilot and manage it across facilities and suppliers. A combination of consumers to take mix of pine and hardwood pulpwood + pine sawtimber = a hardwood pulpmill + pine pulpmill + a chip or pellet mill + multiple pine sawmills. Mills with different scale, operating hours and spread out. Flexible ability to deliver - limited quota restrictions. Central or coastal GA & FL? Could be opportunistic matching process for spare loads and capacity, and with limited control of demand. - timber company

#### Participants - Capacity

- A single crew logger can go from a 30 to a 60 mile haul and run out of trucks. Capacity mismatches are greatest for a single crew logger - smaller logging company's stand to gain the most from sharing surplus trucking resources ... working with 1 or 2 other loggers might make quite a difference. Or single crew loggers may struggle to survive? But single crew loggers tend to stay busy and are very independent and unlikely to change even if benefits of working with others were obvious. Larger logging business' know the benefits and already cooperate, by swapping trucks on occasion. - Contractor/Supplier

#### Participants - Contractor

- Two midsize contractors were mentioned, they could be ideal for a pilot as they would probably stand to gain more from pooling trucks. - timber company

#### Participants - Contractor Different haulage model

- Large logger has 10-12 crews in SE GA & N FL. They work their trucks across their jobs to maximize productivity - Timber company

#### Participants - Past Initiatives

- Control of wood supply and mills make it easier to implement new initiatives. - Contractor/Supplier

#### Participants - Pilot

- A coop of a few large logging contractors can pool their trucks and set their own operating rules and protocols. - Project Team
- A coop of loggers could manage the timber logistics. - Contractor Meetings

- Keen on being part of a Pilot as an opportunity to test new systems with financial support. Deal is he gets to test systems and Endowment gets to publish the data. - Contractor/Supplier
- Key issue in a Pilot is sharing haulage work - he doesn't want a competitor to have a commercial deal to haul from its customer. Pilot should involve reciprocal access to other trucker's customers. - Contractor/Supplier
- Lending your truck asset to a separated truck program is currently regarded as risky - Contractor Meetings
- Likes the idea of a cooperative for trucking and can work with some other local logging organizations. Has thought about it: members run it; sets its own standards internally; trucks leased to coop (would apparently help with insurance, especially for driver with poor record). - Contractor/Supplier
- Need loggers, truckers and mills that want it to work. Set standard expectations for turn times, road conditions etc. to be met, e.g. truck must be able to get to loader without towing on 90% of occasions. Unflinching commitment required. Trucks must go anywhere. Rate is understood and accepted - a fair schedule. Enough scale to get easy optimization opportunities. Communication systems and protocols need to be worked out with loggers. - timber company
- Prepared to work with some other local contractors as part of local cooperative on timber haulage. - Contractor/Supplier
- They felt that the smaller loggers would find it difficult to be in the Pilot as they tend to be more directly involved in their operations. - timber company
- Willingness to participate is a key factor for any Pilot. - timber company

#### Protocols - Past Initiatives

- A large separated trucking trial of 10 yrs ago ran into cultural issues - loggers don't want outside trucks on their job. - Contractor Meetings
- An issue with a separated trucking system is that you order a set number of trucks (day or week?) but can get no more. - Contractor/Supplier
- Contractors had issues with timber being moved at crews with separated trucking program. Loggers can/will only put up with such issues for about 1 week. - Contractor Meetings
- Separated trucking is much more complex to manage. It can enable trucks to switch to dry areas when flooding occurs. - Contractor Meetings

#### Protocols - Pilot

- Any Pilot must deal with potential anti-trust issues. - timber company
- Chain of custody is another issue to manage with separated trucking. - Contractor Meetings
- Don't want to send one of its good compliant trucks away to another party and get a poor one at its crews. - Contractor/Supplier
- Loggers should work out any scheme to share truck capacity as they know each other's needs - Contractor Meetings
- Participants in Pilot will need to understand that results will be published - they will fear that other parties may exploit any findings. - Project Team

- Pilot should have no quota and very clear rules for trucks, loggers and mills. It is a strategic initiative. - timber company
- Suppliers and mills will set rules of engagement for any Pilot, e.g. what are minimum road access standards etc. Inclusion of a 24hr mill should be considered. - Project Team
- To match trucks to under-capacity at crews will need visibility of both trucks and haulage needs. - Contractor Meetings

#### Protocols - Pilot Different haulage model

- Fear of sacrificing logging productivity to maximize trucking productivity (especially if contract trucks are utilized). - timber company
- Loggers truly fear that any truck sharing or dispatching initiative will result in their wood not being picked up. - Contractor/Supplier
- Trucks working for other loggers could risk being outside the 100 mile radius from depot, in which no log book is required. - Contractor Meetings

#### Protocols - Pilot Quota impacts

- Scheduling cannot work until the need to rush to produce before quotas set in is reduced. - Contractor Meetings

#### Protocols - Practices

- Can hold 7-8 loads max around loader/delimiter, in the context of daily production of 17-20 loads of roundwood. - Contractor/Supplier
- Hold up to 30 loads at chip crew - 10 in Roundwood form and balance in spot vans. - Contractor/Supplier

#### Protocols - Productivity

- Trust is biggest barrier to loggers working together. There should be gains from logging organizations cooperating on haulage. No logger (in this part of the State) is in balance for trucking vs logging capacity on a regular basis. - Contractor/Supplier

#### Protocols - Roads

- A scheme for dealing with IFTA (International Fuel Tax Agreement) compliance could be woven into a possible Pilot? - Timber company

#### Protocols - Roads Different haulage model

- Marginal standard of roads is a disincentive to 3rd party trucks hauling from loggers. - timber company

#### Scope - By-products

- By-product flows from our mills are already optimized by large haulage contractor. - Timber company
- By-products contractors already fully utilizing their trucks. And they don't impact logging. - timber company
- No interest in by-products Pilot as (like most mills) it uses one big contractor for all by-products and they optimize the haulage. - timber company
- Potential to backhaul by-products over long hauls in AL by involving the different contractors hauling to major pulpwood using facilities. - Contractor/Supplier

- Why not start with a Pilot based on by-products. May be less complicated than with timber. By-product haulage requirements can be volatile, particularly for particular sites, e.g. during a shutdown or a spike. Wider cooperation on by-product haulage logistics could be beneficial. By-products contractors tend to be mid-size to smaller independents with 1-2 trucks or large fleets with >5-10. Some by-products contractors have spare trailers. Could engage OTR trucks to hook up the spare trailers during spikes. - timber company

#### Scope - Past Initiatives

- Logistics programs need to fit with local industry dynamics, which differ from place to place. - timber company
- Westvaco efforts to get contractors to share spare truck capacity got nowhere - lack of trust. Westvaco then proposed scheme of providing a 3rd party contractor to pick up haulage capacity shortfalls at loggers had high degree of support from loggers at the time - scheme did not get corporate support to proceed. Scheme was to allocate trucks from 3rd party to a logger on a weekly basis, with some rearranging during the week if things changed. - Contractor Meetings

#### Scope - Pilot

- A Pilot will be about matching truck capacity to haulage requirements. It must involve willing participants, including loggers, truckers and consuming mills. The Pilot must be a realistic scheme that has good prospects for success and has the commitment of the participants. - Project Team
- A Pilot would ideally be for a year to test all seasons etc. - Contractor/Supplier
- An open platform may help truck utilization. - Timber company
- Asked if Endowment & Sponsors might buy some trucks for a Pilot - so everyone has skin in the game. - Contractor/Supplier
- Can we monitor just one crew and get something meaningful? ... could then do a little benchmarking exercise at a number of contractors. - Project Team
- Dispatch bureau needs to deal with any administration as timber companies and loggers won't have resources. - Project Team
- How will trucks that only work part time in Pilot be tracked ... won't have full production story. - Project Team
- In Pilot and benchmark phase we can measure days when crews had more loads hauled than normal and see if that is offset by days when they miss out. - Project Team
- Logical for a Pilot to follow a monitoring trial as trucks will be equipped and operators trained - may not finalize Pilot design until informed by monitoring trial. - Project Team
- Make demand & supply numbers visible - Pilot needs to go on for a long period of time to get a truly representative read on what's happening - Contractor Meetings
- Make sure we don't have overcapacity in Pilot, i.e. both logging and trucking need to overproduce to use their normal capacity (which is set for surge production). Extra quota will free up trucking work. - timber company
- Mills could provide extra trucks to make up capacity shortfall. - Contractor Meetings

- Mills, contractors and landowners can all benefit from more productive operations. A bottom up initiative will be more likely to get real engagement from the contractors. - Timber company
- Pilot - have only a group quota and add 10% to encourage participation. - Project Team
- Pilot could target a simple woodflow, compared to a larger diversity of log products. Have low expectations - don't expect to achieve "miracle" % loaded. Start with a "pop-up" demand type of Pilot that uses spare trucking capacity. - timber company
- Pilot needs to be about determining the nature, magnitude, impacts and causes of the trucking/ logging productivity issue. If a Pilot can illuminate what is happening, it should lead to further monitoring trials focused on other locations/ aspects could be informed by the Pilot learnings. Industry and contractors having a better understanding and using this to work out their own solutions to fit their own realities/ circumstances. Solutions may still not benefit everyone because of uneven market power, e.g. far fewer mill owners these days. - Project Team
- The central issue is the industry's willingness to work together, i.e. the mills working with the suppliers. This is the big opportunity. It's not about the contractors doing anything. We must address the system's ability to take production or can't get the gains upstream. - timber company
- The Pilot will be small scale to minimize complexity and enable the inevitable operational issues to be of a manageable scale. It would be easier to prove something with a small Pilot and success was critical to advancing any logistics initiatives. The most important outcome would be that the loggers participating were happy with how it worked and felt, therefore, that it would be worthwhile dealing with all the issues that would come with a change in logistics practices. - Project Team
- There should be additional loads for trucks to haul. The loggers need to get their quota moved on time. There would be a "business as usual" phase or study to benchmark the Pilot. The performance of the loggers and trucks would be monitored - the Pilot will be judged on the perception of participants and observers, supported by quantitative results. The cost-benefit of the Pilot scheme and its potential wider implementation can be evaluated. - timber company
- Wants to see a bottom-up initiative, not top down. - Contractor/Supplier
- We are creating a new industry where trucks are not just another piece of logging equipment. - timber company
- Would like to have greater visibility of outside demand potential to expand its existing trucking networks. A process/system for making transport opportunities more open could benefit everyone. - timber company

#### Technology - Comms

- Communication between loggers for a logistics Pilot could utilize radio telephone, e.g. Southern Link radio. - Contractor Meetings

#### Technology - Pilot

- Apps such as Uber, Dat load, Convoy are all Agents that act as the middleman to simplify transactions between strangers - the hook-up aspect of the App is nothing without the underlying commercial agent role. If there is to be a similar timber hauling App, it will need to simplify the contractual relationship between loggers



and truckers that are strangers, i.e. it will need to be an agent/middleman so that trucks and loggers can have one contract with Agent rather than every truck needing a contract with every logger etc. - Project Team

- Most timber harvesting is in rural areas, where cell phone coverage is uneven. Good communication systems are a vital aspect of logistics, especially if trucks/ loggers are relying on an App to engage or trucks are trying to find their way to (organize a load at) a new logger etc. - Project Team
- Technology that can assist Pilot, e.g. GPS or ticket systems, to provide visibility. Uber scenario described - comment was “ that is a good idea” - Contractor Meetings
- Uber type App could run into problems if truck didn't show up or road was a mess etc. and parties may then write process off. Need to actively manage the engagement of loggers and trucks that are strangers - a bureau, perhaps? - Project Team

#### Location - Wood Basket

- A potential wood basket (drainage) for the Pilot is SE GA, where there are pulp mills in close proximity. Other large local mills at Brunswick, Savannah, Waycross and some small independent mills. - timber company
- From experience across South, there are 2 places for a Pilot; upstate SC or Central/ South AL, which have good mix of mills. More large loggers in C/S AL may make it an easier proposition. - timber company
- Ideal wood basin for a Pilot might contain 1-2 pulpmills and a few sawmills. - timber company
- Major sawmills and large pulpmills near Montgomery. - timber company
- Nearer SC coast or E GA is a good Pilot location as pulp industry has good presence. - Timber company
- Pilot should be closer to pulpmills, i.e. not inland from Columbia SC. - timber company
- S. GA / N. FL is a good place for a Pilot. A wood basket that cuts across consuming mills. Demand is for pulpwood, sawtimber and poles - not chip-n-saw. Most of this comes from plantations. There is a lot of competition for pine stumpage. - Contractor/Supplier
- SE GA is often suggested as Pilot location. Need a Pilot that involves mills from several of the key Sponsors to get their backing of Pilot and wide acceptance by the Sponsors of any findings. Some of the keenest participants may not be located ideally in relation to where the Sponsors have most interest. - Project Team

#### Context - Past Initiatives

- Separated trucking undertaken as a way to deal with surges in hauling capacity requirements. - Timber company
- Trucking constraints have a big impact on logging productivity (and cost). - timber company

#### Context - Pilot Different haulage model

- Scheduling of separated trucks can't work while quota causes underutilization of capacity. Loggers would rather run their own trucks - separating will result in loss

of control. Loggers with multiple crews do some separating now. - Contractor Meetings

Context - Productivity Quota impacts

- Let trucks run 5 days - minimize quota shutouts. - Contractor/Supplier

Context - Cost Trucking unprofitable

- It is not cost effective to haul for others at standard haul rates. Better to send drivers home. Extra liability when hauling for others. - Contractor Meetings

Context - Cost Quota impacts

- Trucks run out of work on Friday and are then switched to hauling chips, so that drivers can earn a full week's wages - this results extra trailers sitting idle. - Contractor/Supplier

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