



The Blue Yonder Digital Freight Matching Enablement

Blue Yonder – API-enabled Dynamic Price
Discovery - Digital Freight Matching Capability

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As digital freight matching becomes more prevalent, Blue Yonder is offering two logistics network offerings (DPD and FCO) that are gaining popularity among shippers and carriers. The scalability of the two solutions will allow for more affordable out-of-the-box carrier connectivity, securing Blue Yonder's position as the preferred TMS provider across all tiers in the Transportation market.

Digital Freight Matching

U.S. Trucking Companies

Most U.S. trucking companies are not large in scale. According to [TruckingInfo.net](#), there are approximately 1.2 million trucking companies in the U.S. and about 97% operate 20 or fewer trucks while 90% operate six or fewer trucks.

Also according to TruckInfo.net, the U.S. economy depends on trucks to deliver nearly 70% of all freight transported annually, accounting for \$671 billion worth of manufactured and retail goods transported across the country.

Digital Freight Matching Defined

Shippers continue to face challenges that have only gotten more evident with COVID-19. Challenges include truck driver shortage, lower capacity and rising freight costs.

One solution that has emerged recently to combat these challenges is digital freight matching. Companies create a digital freight matching platform,

such as an app, that matches shippers and carriers with truck drivers with the capacity to transport their loads. These platforms provide a price quote that can be accepted and locked in by the shipper/carrier.

According to [Silpa Paul, Industry Analyst, Mobility, with Frost & Sullivan](#), digital freight matching (or what the Frost & Sullivan Truck-as-a-Service Market, Forecast to 2025 report refers to as “digital brokerage solutions”) helps “enable faster brokerage, instant electronic upload of proof of delivery, as well as electronic payment terms.” According to [the Frost & Sullivan](#) report, digital freight matching has a revenue potential of \$54.2 billion

Digital freight matching will facilitate the balancing of supply and demand, eliminate the pricing and capacity imbalances. This provides tremendous value to both the shipper and the carrier. Shippers can ensure they are capitalizing on the best rates available while carriers and drivers maximize their assets.

Blue Yonder Network Offerings

Network Solutions

While digital freight matching is a good solution, it presents some challenges for the old guard. The companies creating these digital freight matching platforms are typically the more innovative players who can move quickly when it comes to technology and infrastructure.

The key for other players will be engaging with a transportation management solution provider, like Blue Yonder.



Blue Yonder created two solutions (SKU's) allowing companies at varying levels of maturity to integrate through its TMS to gain access to Blue Yonder's customers (matching supply and demand). The two solutions that allow shippers to gain access to near real-time access to capacity are:

- DPD – Dynamic Pricing Discovery (SKU: 1003290000)
 - Focus is on load optimization vs. lane optimization
 - The solution allows shippers and carriers to quote near real-time price and freight capacity. Any customer currently onboarded with the company's "aggregation" platform can utilize the DPD. Blue Yonder TMS with API is connecting shippers and carriers (who aggregate capacity as brokers) in the digital freight matching market, enabling near real-time visibility and matching of tendered loads with bidding carriers.
 - Target personas are transportation procurement, procurement, transportation, and logistics management.
 - The KPIs would be transportation spend, transportation optimization, and SLA
- FCO – Freight Capacity Optimization (SKU: 1003290000)
 - Focus is on lane optimization vs. load optimization
 - The solution aims to help shippers access freight capacity at lower costs while improving carrier relationships and optimize revenue generating miles, i.e., reduce empty miles.

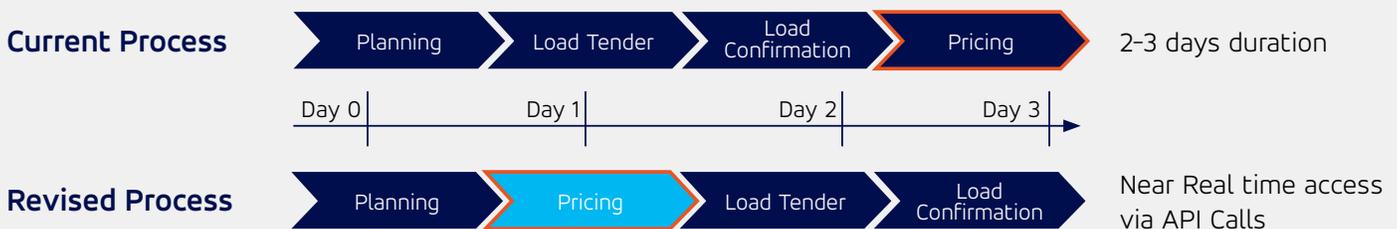
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These two solutions are powered by Blue Yonder's Luminate™ Platform, which runs on Microsoft Azure and combines data from both internal and external sources – spanning shippers' digital supply chain ecosystems – to leverage both artificial intelligence (AI) and machine learning (ML), enabling smarter and more actionable business decisions.

These two solutions are enabled through the Blue Yonder TMS by connecting carriers and shippers through the Blue Yonder Network. The Blue Yonder Network is a collection of multi-tenant services focused on partner and external system communication and interactions. The Blue Yonder Network functions as an intermediary between Blue Yonder customers and Blue Yonder partners. The Blue Yonder Network allows customers to communicate with multiple providers. Each provider may support one or more features. The Blue Yonder Network also allows Blue Yonder partners to respond to customers using a single integration point without requiring product or version specific development.

Blue Yonder is the only TMS that can offer real-time dynamic capacity and rates. The Blue Yonder Network provides the mechanism to match supply and demand, creating an environment where both

Figure 1



carriers and shippers benefit from near real-time capacity/price matching. Blue Yonder enables inverting the process by pulling the rate bidding to the start of the bidding process versus the end (when commitments for capacity are fixed).

(See Figure 1)

Benefits of Network Solutions

The API-enabled tender and response of the Blue Yonder Network solution allows for a revised process that inverts the traditional business process by pulling the rate bidding to the start of the bidding process compared to the historical approach where rates were only confirmed after the capacity was committed, at the end of the process.

The spot market is quite punitive with shippers who are often being quoted higher than market-related rates and carriers getting lower than expected rates. For example, carriers may be earning 1.25 to 1.4 times more on the spot market than if fixed on a contract and shippers may pay up to 3 times for spot freight versus contracted rates.

The benefits of the DPD and FCO solutions includes:

- Access to an extensive shipper community (500+ Blue Yonder TMS users) who have large amounts of freight dollars to spend
- Access to asset-based 3PL transportation providers, aggregators, non-asset-based carriers and freight brokers

- Blue Yonder has about 500 active BY TMS shippers who cumulatively move an estimated \$60B of freight per annum
- Connectivity through (Blue Yonder API) Blue Yonder Network allows access to the largest base of single-point users
- Blue Yonder TMS offers near real-time dynamic capacity and freight rates in a manner that allows for supply and demand to form part of the decision at the start of the carrier selection process of selection (vs. at the end which is the current scenario)

(See Figure 1)

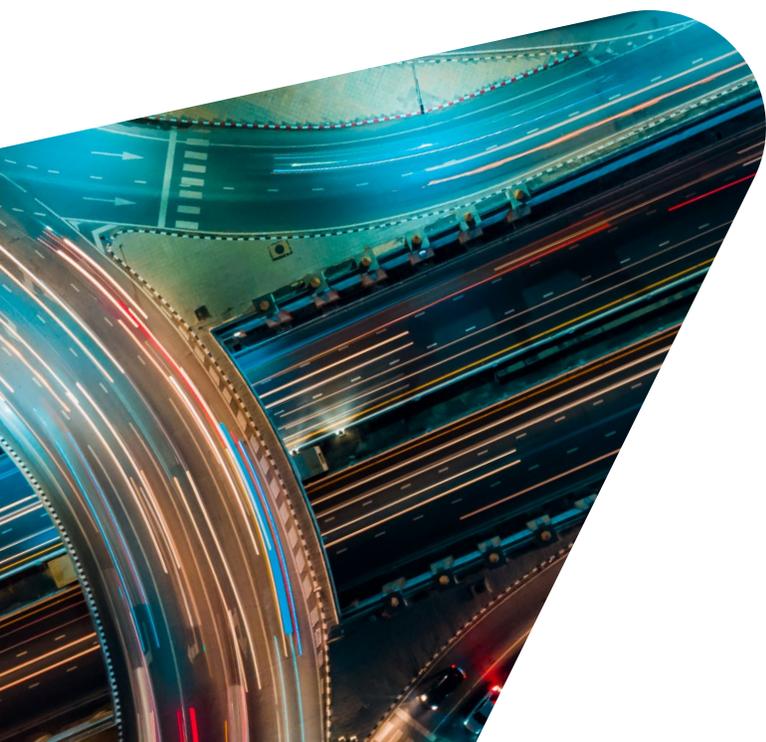
The advantage for carriers, such as Amazon, JB Hunt, Penske, Ryder, Uber Freight, etc., are:

- Creates visibility of their capacity
- Provides demand in support of their revenue and growth targets
- Through one connection to the Blue Yonder Luminate Platform, they can integrate with all Blue Yonder TMS customers and receive their tender
- They can do away with the EDIs, which is costly and slow
- They will gain access to previously unknown demand, allowing for business growth and competing in a market to which they previously had no access.

The advantages for carriers and shippers for participation in the Blue Yonder Network:

- Access to extended capacity
- Price equity
- Higher load matching opportunity
- Access to the best prices/service provider by lane and modality
- Real-time price confirmation by load
- Disintermediation of human interaction for 80% of loads

As more shippers and carriers begin to utilize the DPD and FCO solution, the market effect increases allowing the force of supply and demand to direct price.



Opportunity for Shippers and Carriers with DPD

Blue Yonder has found great the most interest from carriers in the Dynamic Price Discovery (DPD) solution. The TMS-enabled, API solution allows existing Blue Yonder TMS customer to leverage the Blue Yonder Network and capacity providers (carriers /brokers) to optimize margins and (re)position assets in the network to balance supply and demand. It provides shippers with instant access to dynamic rates through REST API. On the capacity side, it benefits the carriers/brokers – both large and small – by providing access to an extended demand (shipper) pool. It is expected that the incongruity between demand and supply will resolve over time as the market forces dictate where to route assets and allows for margin plays.

The interest in DPD stems from:

- Freight capacity/Driver shortage
- Delays in tender process
- Manual process – max 30 per day/FTE
- Automation – significant productivity gains
- Impact of Electric Logging Devices ELD
- Elimination of waste ~ \$3 Billion

- API – near real-time
- Cost of EDI – switch from VAN BUS

The benefit to any of the marketplace users is the opportunity to optimize asset utilization, placing assets in geo-locations where there is a shortage of supply. Demand will determine price and carriers will have the data to manage the re-(al)location of assets in the market to address deficit of assets in regions – balancing the network capacity through geographic visibility of supply and demand.

It provides an easy way for Blue Yonder shippers to connect to the carriers who could be a 3PL, capacity player, broker or aggregator. Shippers using Blue Yonder TMS v2016.1 or Blue Yonder TMS Express will have automatic access to the API for DPD. However, shippers on TMS v2016.1 and forward will need to deploy Integration Client. The most current Blue Yonder TMS users will have automatically-enabled access to the API for both DPD and FCO.

Once a carrier is onboarded and the communication with the Blue Yonder Network enabled, connecting shippers to the carrier is a very seamless exercise with about 48 hours of engagement from the IT teams to test communication and establish if the “tender request – accept/reject” workflow is successful.





All 3PL contenders (e.g., JB Hunt, Ryder) will benefit from the ecosystem of transportation providers – alleviating both the capacity and driver shortage. Blue Yonder becomes the agnostic enabler for shippers and carriers to connect to each other through the API-enabled Blue Yonder Network. Once these connections are established, the carrier gains access to the shipper community which introduces them to demand they may not have previously had visibility of. In turn the shippers can nominate which carriers they connect to and they get access to more options by geography, corridor, modality, service level and price. The Blue Yonder Network ecosystem provides a single point of access to where the available capacity and price are made visible, facilitating easy access for carriers to ingest the data and respond to market forces (e.g., JB Hunt, Schneider, Loadsmart, Uber Freight, CH Robinson, K/S).

Integration and Technical Benefits

Key Features:

- Backward compatible – uses existing SmartBench functionality for UI access and enablement
- Supports N workflows
 - Dynamic Capacity Quotes and Tenders first
- UI Initiation – Supports calls from existing Transportation SmartBench with context

- Provides Automation
 - Event Notification file watching
 - Polling for loads using customer configured searches
 - Rule-based actions
- Configuration caters for
 - Maps from customer model to Blue Yonder Network model; and
 - Maps responses to TMS structures
- Calls to Blue Yonder Network
- Listens for calls from Blue Yonder Network

Integration Benefits to Customers

- Customer maintains control of the mapping of their data model to the Blue Yonder Network model through easy to use UI
- Customer controls the automation through Event Notification watches and Polling (internal: like Job Server, eventually Blue Yonder will wrap this into the Job Server)
- It is backward compatible – it will be backported through v2016.1. Currently building versions 2016.1, 2018.1, 2018.2, 2019.2 and 2020.1

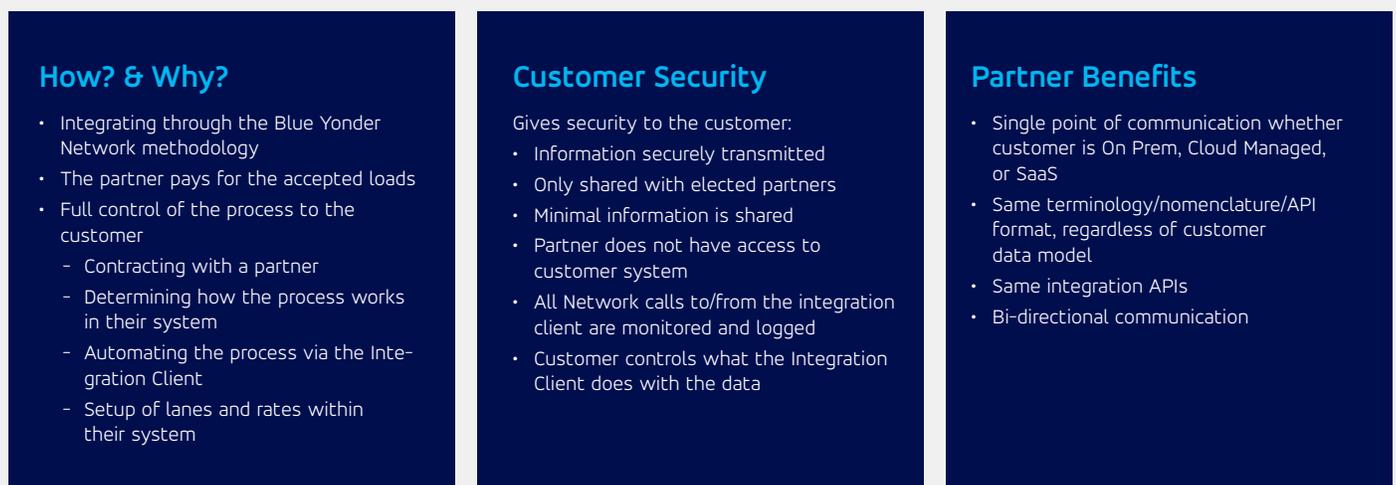
- Planners can directly interact with Dynamic Capacity providers (carriers) through the UI to request quotes and confirm tenders immediately (near real-time)
- Integration Client works with the customer system the way the customer wants it to be
 - Charge overrides vs. External Costs (2019.1 and above)
 - Uses client SmartBench searches for automation
 - Screen elements for UI initiation allow fine grained access controls for Planners
 - SmartBench or TMWeb
- Simple module that will continue to enhance over time, responding to customer requests quickly
- Plugs into their existing ecosystem
- Scales just like any of their Web/Smart Bench modules
- Blue Yonder will extend the Integration Client to other workflows/services as they are released, so customer touchpoint stays the same. No jarring changes for them.
- Blue Yonder Network can send requests for Price Discovery and send tender requests to the carriers (instead of EDI requests). Carriers want only one connection to respond to shippers using Blue Yonder TMS, they do not want to build a single point integration with each shipper and test it out (wasted effort). One plug to connect to all shippers is a huge cost saver with faster time to market for them. **(See Figure 2)**

Roadmap for Dynamic Price Discovery Self Service

Initial version will require manual handling by Blue Yonder Cloud Ops, but in future the Blue Yonder Network will have self-service for customers and partners allowing for:

- Discovery of carriers though workflow/service
- Initiation by shippers of requests for tenders on loads from nominated or selected carriers
- Notification to carriers of customer requests:

Figure 2: DPD & FCO Benefits



TMS Application Considerations

Shippers with BY TMS: 2016.1 & forward, Integration client installed and configured

Shippers with BY TMS: pre-2016.1 - need to upgrade

Shippers with other TMS: SI partner supported integration - straight to Carrier platform

- Set up of carrier credentials, to be used by the Blue Yonder Network when calling to carrier system
- Set up of customer specific information (pair partner company identifier to Blue Yonder company identifier for easier communication)
- Reporting views
- Error diagnosis views
- Audit views
- Carriers may enable new workflows/services

The solution aligns with any customer with the scale, presence and ecosystem to support the ambition of becoming an aggregator of Transportation (TP) services and rates, positioning a carrier as a regional or market-segment specific, e.g., TP asset based, TP non- asset based, cold chain, chemical specific, flat-bed, bulk (dry/wet), pneumatic, etc.

Define Target Market Segment

As lines continue to blur between transportation providers, technology providers and carriers, it is important to identify whether:

- a) a company is looking to utilize and absorb transportation services, whether provided by Blue Yonder or provided through Blue Yonder Network enablement as a network connectivity connection, or
- b) a capacity provider, or
- c) technology providers are looking to expose their services into that network.

Micro-segment communities are blurring as companies seek synergies and margin from overlapping presence in complimentary segments. For example, BNSF bought Unlimited Freight, adding flatbed capabilities; Ryder bought MXD, becoming the No. 2 player in big and bulky e-commerce; and Hub Group bought CaseStack, combining intermodal logistics with asset-light warehousing.

For the purposes here, target market segments are defined as:

- a) Carriers: Asset owned, e.g.: Covenant, Knight/Swift, JB Hunt
- b) Shippers: Tier 2 & 3 shippers
- c) 3PL - non-asset based, e.g.: DSV, Ryder, Penske on the 3pl side:
- d) 3PL - asset based: refer to a & b above
- e) 4PL e.g.: DSV, mixed tech/asset based/non-asset - DSV, K&N
- f) Technology players, e.g.: Blue Yonder, SAP, Oracle, MS
- g) Aggregator: e.g., Loadsmart, NFI

Potential Risks to Existing or Future 3PL Customers

Blue Yonder continue to be an agnostic/non-exclusive software solution provider to any carrier/aggregator who is interested to position themselves as an aggregator of rates and capacity in the market, such as Uber Freight, JB Hunt, BNSF, XPO, K/S, Ryder, etc. Blue Yonder will maintain and strengthen its position as a leading-edge technology partner with the enabling capability to support disruptive change and the matching of demand and supply in a market filled with disparity.





Blue Yonder should and is experiencing an acceleration of demand for the DPD service from carriers who understand the changing market dynamic and who do not want to be left behind. These carriers will leverage the Blue Yonder technology capabilities to ensure relevance of their market position. For the solution to succeed, Blue Yonder will need to introduce the value-added service of DPD and FCO to shippers to secure their volumes through the Blue Yonder Network by virtue of the carriers who signed up.

Notes on the Blue Yonder Network

Customers

Blue Yonder customers interact with the Blue Yonder Network using a Blue Yonder provided Integration Client or by directly implementing Blue Yonder Network Public APIs. When using a Blue Yonder provided Integration Client, customers can configure integrations to multiple partners using a single-user interface. Integration Clients will facilitate interaction with the Blue Yonder Network by:

- Enabling UI or other User interactions
- Enabling automated processes
- Formulating calls to the Blue Yonder Network

- Processing responses from the Blue Yonder Network and acting upon/storing them within the customer's system
- Responding to calls from the Blue Yonder Network and processing them

Partners

Blue Yonder partners use the APIs exposed by the Blue Yonder Network to provide new capabilities to Blue Yonder customers. A partner who provides a feature to a customer is referred to as a 'Provider' in this context.

Important integration notes for partners:

- Partners are expected to implement one or more APIs for a service which they will support.
- Partners must support OAuth2 authentication. Partners can provide separate credentials for each Blue Yonder customer. These credentials will be used to request a token which will be used for subsequent API calls from the Blue Yonder Network.
- Blue Yonder Network APIs may be extended with non-breaking changes without requiring a version change. As such, fields and structures may be added in the future. Partners should ensure that their systems ignore unknown fields/structures rather than erroring out.

- Services may support both synchronous and asynchronous responses. Each API indicates expected response times as Service Level Agreements (SLAs). If a partner cannot reliably provide synchronous responses within the indicated SLA, the partner should implement asynchronous responses. All partner endpoints should have a 99.7% uptime. Blue Yonder reserves the right to time out individual calls or suspend partners who cannot meet SLA requirements.

API Initiation

Each API indicates whether it is initiated by Customers, Providers, or the Blue Yonder Network.

- **Customer initiated** - A customer will initiate this call with the Blue Yonder Network, either directly or by utilizing a Blue Yonder provided Integration Client. Partners are expected to accept this call after it has been authenticated and routed by the Blue Yonder Network. Partners must expose a URL to receive the API call at the defined endpoint. Partners should process the call input and either respond with the result or reply with an acknowledgement of receipt.
- **Provider initiated** - A partner will initiate this call. The partner will call the Blue Yonder Network with information that should be routed to a customer. The partner will call the endpoint exposed by the Blue Yonder Network using an OAuth2 token retrieved previously using the credentials provided by Blue Yonder. This type of API can be used to respond with the result of a prior request that was processed

asynchronously, or to push information to the Blue Yonder customer based on an external event.

- **Blue Yonder Network initiated** - The Blue Yonder Network itself will initiate this call and route to a Partner. Partners should process the call input and either respond with the result or reply with an acknowledgement of receipt.

The tender API of the Dynamic Capacity service covers a subset of all EDI fields. It is focused on dynamic rate providers, who are typically Truckload (TL) or less than Truckload (LTL) and doesn't necessarily need the level of detail that a contract carrier would in their tendering. However, if the details provided in that API are enough for both contract and dynamic price discovery, the same API can be used for both. We are working on a Carrier Communications service that will have full-featured tendering, enough to replace all EDI tendering flows.

For contract rates, shippers can:

- Use EDI based tendering
- Use Dynamic Capacity tendering, differentiating contracted vs. dynamic based on SCAC, service type, and/or quote ID (if quote ID isn't present, it was a contracted rate)
- Use Dynamic Capacity tendering for now, with plans to switch to the Carrier Communication service's tendering once available





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