

Chris Henry

Thanks for joining us. I'm Chris Henry. This is part of our best practices series. And we've done a number of these. I'll go through this. It's a chance for us to share what we've seen and interview.

Typically, we interview our partners today because of BizSpeed rolling out our auto-routing. We're going to interview our VP of engineering as well as Doug, our COO, and talk about auto-routing, not just ours, but generally what we've seen from an industry standpoint.

So I'll go through introductions, talk about the goals of this. This is part of our best practices series. Like I mentioned, February this month, we're doing auto-routing and optimization.

Last year, plus we hosted a number. So we did NetSuite, we did a fuel rental, a rental fuel management, we did iRely, M2X for route optimization, which is similar. We've done fuel supply management with commodity trading and risk management.

If you want to see any of these, you can reach out to Charlie. Charlie's on. He's our sales director and coordinates with our marketing team to make sure that you'll get the replays of those and the summaries of those.

So I'm Chris Henry. I'm the host. I'm not going to do a lot of talking today like normal, but for each one of our panelists, we've got Matthew Belk and Doug Hollowell.

Like I mentioned, you want to tell us a little about your background because it's BizSpeed. One of you, Doug, I guess can do the company overview about your role. So you want to start Doug?

Doug Hollowell

Sure. Good afternoon or good morning depending on where you are. I'm Doug Hollowell. I'm the COO here at BizSpeed. So my role is to oversee our project implementation teams and activities as well as our customer success group.

Little background on BizSpeed, we were based here in Atlanta. We started in 2001 and in fact, March 1st of this year will be our 25th anniversary in business. So I've come up on a big anniversary.

We started off doing lubes in 2006, working with an optimization partner and doing integration to ERP. And since then we have migrated our business to exclusively work with bulk and package delivery. And since then, we've expanded to include transport fuel, tank wagon fuel, propane, home heat, and chemicals delivery as well.

We have an entirely web-based routing and dispatch system and a suite of driver applications, the main application being the one that we use for bulk and packaged delivery, mostly in the fuel and lubricants industry.

We work with a number of route optimization companies that do what we call kind of high-level sophisticated routing and we'll get into a little bit later into what that means, different from different levels of routing and optimization.

And then as I mentioned, our driver app is a single application with workflows driven by the configuration in the system. So in the same application, they can deliver, excuse me, they can deliver a bulk product, they can deliver packaged products and even on the same order delivery.

So we also have customization into electronic meters so that we can capture delivered quantities directly from the meter. That's kind of the summary on me.

So I'll pass it to you.

Chris Henry

And we've worked with a number of routing systems, advanced routing systems where they've used our mobile. Matthew, I want to give us a little bit of background on you. Matthew has been with us the whole time, but go ahead.

Matthew Belk

Right. Hello everybody. My name is Matthew Belk. I've been with the company since its inception, back in 2001.

I've been primarily responsible for designing and building every generation of our mobile app that we have in the field dating back to, as Doug mentioned, 2006, on Windows mobile devices, very old legacy devices, up to now, including our cross-platform mobile app, suite of mobile applications, our primary bulk fuel and lubes delivery app, a 3PL app, a food delivery app for that vertical food service, including sales, kind of a sales assist app that we have, as well as all the truck technology that we install on the trucks to manage the communication and connection to the registers in the back.

Now, we've decided to move our Windows Forms-based back office application to a pure web environment and are starting to add many more features to that, including auto-routing, which we're going to talk about today.

Chris Henry

Awesome. So again, the purpose of this, this is slightly different because we don't usually talk about us, but it is to share best practices, talk about real-world experiences, and to help you build a better logistics organization.

This is both for existing customers as well as new customers. This is going to be recorded. If you have a question, there's a Q&A section, you can put your question in the Q&A, and Charlie will monitor that and make sure we answer it.

This is really a discussion just like we've done with others. The only difference is we'll have a brief period where Doug shows a demo of our auto-routing. But other than that, it's really to talk about best practices and help people understand what's involved in auto-routing and what that looks like. We've seen it across our system since we started doing this in 2006.

So I'm going to stop sharing my screen at this point. It's really just a discussion point. So let's start with, we already did the BizSpeed intro, but let's start with what is auto-routing? Doug, do you want to answer or Matthew? - Sure, I'll go.

Matthew Belk

Auto-routing is basically how you can imagine it is. It's you take the pool of, and number of orders, we'll say a hundred. You take pool of trucks, we'll say 10 trucks. And you basically tell a system to drop all these hundred orders on all my 10 trucks. And hopefully the system will do it in an efficient way so that you get all the orders serviced in time within various constraints.

Maybe you have customer service hours, you have to respect customers are only open from a certain they're only able to accept deliveries from certain in certain time windows of the day. You've got drivers that you don't want your drivers to run 14 hours in a day. So you have constraints on the trip time. You have constraints on where the drivers can load their product if they're not loading it your own warehouse.

So that's all of what kind of auto-routing encompasses and making sure that we, when it's all said and done, you get a job back that's got as many orders as possible, routed on as many trucks as possible.

Chris Henry

And so what's the background? Obviously, we've got a lot of partners and we're going to talk about the difference, but what's the background and why did BizSpeed build this? How do we answer that?

Doug Hollowell

We've had a routing engine in our software for quite a while and some optimization around those routes, but it was purely a manual dispatch system. So you still, the user had to drag orders onto specific routes, assign to specific trucks, and they had to build those routes individually.

And really the main purpose of an auto-routing system is to save that piece of the work so that you get good routes that are efficient like Matthew explained, but they give you a good starting point for your dispatcher to work from. So they're not spending all that time figuring out which orders, which routes to drag orders onto.

We sort of take that first level of optimization for the dispatcher and then you can use that dispatcher's knowledge to deal with the exception. So there's always going to be an order that needs to be delivered first because it was missed the previous day or something, customers run out and you need to get them, you need to get to them immediately. A dispatching engine is not going to know that so you still need the dispatchers to handle those exceptions.

But really the intent of this is to provide a mechanism for the dispatcher to get a starting point of efficient routes that they can start from each day and save the time that they would normally spend assembling those routes by hand.

Chris Henry

So maybe to start off, I mentioned this, but tell the audience, what's our experience working with auto-routing? Because we work with a number of systems. We don't have to go into those systems, but just kind of where those are. And they have been around for a long time, right? So even since we first started, we started with those, right?

Doug Hollowell

Yeah, we've got extensive experience, obviously since 2006, working with some very sophisticated auto-routing systems. And these really are well suited if you have a very complex routing situation. So if you've got, if you need to take into account axle weights and delivery sequence so that you don't reduce particular axle weights, kind of an extreme example, but cases like that, that these systems are able to accommodate all those.

Most of our customers don't need that. Most of them really don't have that complex of a routing situation. So we wanted to create something that would get a good way toward what those systems offer, but not without the need to get all the way there. They tend to be complex to set up. The users have to be fairly advanced to operate them. The data setup can be very rigorous on those systems as well.

Chris Henry

I think with any system, obviously, we'll talk about rollouts later on, but what's involved, so just in general, if you're going to set up an auto-routing, what does somebody need to do to set up auto-routing? Because it's not like you can just turn it on, right?

Matthew Belk

No, I would say that, you have to have a good handle on the demographics of your fleet for sure, what the capacities are of those. I mean, we talked about axle weights are not as

important, but obviously, if you've got a fleet of tank wagons, we need to know how big the compartments are. How much they can hold.

We need to know when we can make deliveries to your customers, right? Some customers, some of them may be open 24 hours a day, seven days a week for you to show up at other customers. Based on where they are, they may only be able to accept deliveries from six to eight in the morning, and again from six to eight in the evening, just because their yards, their parking lots are small when they need to have the room for customer cars, right?

Then there's the product information. We need, it's critical for us to have unit weights and unit volumes, whether they're bulk densities or pack unit volumes, where a case of something may consume four cubic feet, whereas a case of something else may consume eight cubic feet.

And in each of those cases, maybe wildly different in terms of weight, we need to be able to know that so we can know whether or not we've cubed out or weighted out a truck as we're loading it as we're specifying how much to carry on it.

Chris Henry

Got it. Who is this, like who did we build this for? What would be an ideal customer profile? How would you guys look at that? If somebody, do you look at it, are we thinking that it's fleet size or more complexity based?

Doug Hollowell

I'd say more complexity-based around what your how sophisticated your routing needs are. It's if we try to design something that's easy to use works with a pretty wide variety of the number of trucks at a site anywhere from a couple of trucks up to a pretty large number.

Obviously you get more efficiencies if you have more trucks to route across but really something that's a easy to use tool compared to some of the more sophisticated packages.

Matthew Belk

I would say that if you have very challenging calendaring or customers that have very challenging calendars, multiple calendars per customer, a lot of demands on driver capabilities or truck capabilities that may prompt you to think about a much more advanced solution.

There are some yards, some customer sites can only accommodate a truck that's so long, right? Or so big or so tall. Because there you are just isn't just kind of there's no turning radius for a bigger truck. Things like that I think would maybe tend you to want to think more about a more advanced solution than ours.

That's what to say that we won't get there eventually, but we're still it's still a nascent technology for us. And so we're we're trying to walk before we run.

Chris Henry

So we're going to show what we have, so we will do a demo in just a little bit. But you mentioned, I think it's worth talking a little bit more about data-wise. What are some of the key data things that you need to have in order to set up auto-routing? It doesn't matter what system you have, ours included.

Doug Hollowell

Yeah, so obviously, customers need to be geocoded. We need to know where the deliveries are going to be made, Trucks, your fleet vehicles need to be set up so we need to know how big the compartments are, what the capacities of the compartments are, the weight capacities of the trucks, the volume capacities.

Products need to be set up with, like Matthew mentioned, densities, weight, so we know how much space they consume and how much they weigh. So while we build the routes, we know that we're we're not overloading a compartment and we're not overloading the truck in whole. Those are kind of the big ones.

There's always other really in any routing system. Data is the big thing. Clean data is important, especially things like customer addresses. It's pretty common for people to put other things in the customer address fields. And obviously when you need a geocode and address, then it isn't helpful to know that the customer's phone number or their PO number or something like that.

So those kinds of things are definitely critical to being able to implement this in any routing system.

Chris Henry

What do you see as resistant? So I know that's one of the things that from a sales standpoint, but also from an implementation standpoint, when you roll this out, like what are some things that you hear from a dispatch standpoint? And I've got a following question for that too.

Doug Hollowell

Yeah, inevitably it's going to build different routes than your dispatchers will build to start out. No question about that. The dispatchers are used to taking into account all kinds of things that they know that the system can't possibly know unless you tell it.

So if they know that a customer can only be delivered to until a certain time, then that's going to need to be configured in the system. So pretty common that you'll start to run routes and the dispatcher think, well, that'll never work because this customer needs to be delivered by this time or this cover can't be delivered before this time.

And that's where you've got to get that tribal knowledge out of the dispatcher's head and into the system. And that's where the data configuration is key. But that's kind of the key, the initial resistance point that you'll run into.

And then as they get more comfortable and realize that once that data, once their knowledge gets into the system, it's building routes much closer to what they would build and they'll frequently even see advantages over routes that they may have built.

Chris Henry

And so how do people get over that? How do you get over that where dispatchers don't, their resistance, what have you seen? Because you've seen this a lot. You've done a lot of of implementations that involve auto-routing. So your personal experience, yeah.

Doug Hollowell

Yeah, it's helping them understand why the system is coming up with the solution it's coming up with and where the efficiencies are in what the solution that the system is coming up with. And training obviously is hugely important. They need to understand, how it works so they're using it correctly.

If you don't use it correctly, then you may not get optimal results from it as well. So it really just comes down to training and time spent using the system to get comfortable and making sure they know how to go in and update the data. When they see a result that they didn't expect and you can identify why they got that result then going in and updating the configuration data so that next time around, it'll hopefully handle it better.

Chris Henry

I know one of the things when you get into advanced routing - This is not something that we would see, but sometimes they'll send two trucks to one location for an order and the dispatchers don't agree with that. But the reality is you eventually can show them, "Hey, it's more efficient to send two trucks and you can get more." But those are the kind of things I think I've seen with that.

So let's jump off. Doug, if you want to just give a quick overview and do a demo of it just so that people get an idea, then we can go back and ask some more questions and we'll walk through. Let's see what it looks like. So we've got about 45 minutes of this. We'll be no more than 15 minutes. If people want a longer demo, go ahead and contact Charlie. But obviously we are going to talk about rolling this out to our customers as well at the end of this. So.

Doug Hollowell

Sure. Everyone should be seeing that. So this is our mobile hub, the web application. And many of you have probably already seen this before and we've got some existing customers on here. If you haven't seen it, then Charlie would be happy to arrange to show it to you. So I'm going to go, I'm not going to get into any other capabilities.

So I'll go to the auto-routing is a menu option under our under our dispatch menu. And once I select it, it's going to come up with a screen that's to start off with is fairly Spartan, pretty simple. And basically all I need to do is select the day I want to route for.

So I'm going to create routes for tomorrow. and then I'll create a new job. And a job is a routing set, I guess, is probably the way to put it. So a job could be routing fuel at a specific depot. It could be routing just lubes at a specific depot. It could be routing a specific product at a specific depot. However, you want to approach the routing. And we can create multiple jobs.

So if you're routing for three depots, you might create six different jobs if you're routing for both fuel and lubricants while you're routing.

So to create a new job, I'll just click on new job and to orient you to the screen here, I've selected a depot of the Atlanta bulk plant and there's a list of depots that you can select from of all the depots that are set up in your system. The dates, the first column over here are all the unrouted orders that need to be routed.

So I've got it set up, I've selected a week worth of orders, and we've got some data seeded, so the orders are in the past. And then within those orders, I can kind of slice and dice what, how you want, what orders you want to see here. So if I hit the edit search button here, we get some advanced search.

So I could add additional depots if I wanted to route for multiple depots simultaneously off the same trucks, specific order types. So if I want to route only fuel orders or only lubricants orders or transport orders, I can select these here.

And then there's some other things we can do around priority orders, specific route zones. If you want to assign route zones to customers, then orders created for those customers will all get tagged with the same route zone. So if you're going east of your depot, you can search only for orders that are east of the depot, for example.

And then we can also route by product, which is actually the way I'm going to start this one off. And this is just a list of all the products that are found on the unrouted orders that are over here on the left side. So I'm going to go down and I'm actually going to narrow it down quite a bit. I'm only going to do the diesel clear and dyed diesel orders.

And if you look over here, you can see that we're starting with 94 total orders and this is a mixture of fuel and lubricants orders. So once I hit search here, it's going to go through and apply that search creator. So now it narrowed it down to 81 available orders over here. Once I selected the depot up here in the center panel, then we're seeing all of the fleet vehicles that are assigned to that depot.

So we've got 10 total vehicles, one we've got set up as a lubes truck and the rest are all our tank wagons. I've deselected the lubes truck since we're only going to route diesel fuel on this. Additionally, back on the order side here, if I want to see what's on these orders, I could click on the little box icon here for the product summary and it'll give me a quick overview of what's on the order.

So this one's got 2,500 gallons of clear diesel and 1,000 gallons of dyed diesel on it. So this can be helpful if you're trying to decide if there are certain orders you want to exclude for one reason or another. You can do that here. So I can go through and individually select to include or exclude orders. I can just blanket select all of them or do all of them and then remove any orders that I don't actually want to route.

And the same with the trucks over here. Certain trucks are out of service. You can just deselect it or if you want to use it on a different routing job, then you can deselect it and then save it to use there. I'm going to go ahead and select all nine of these. And you can see the capacities of the truck here. So the volume capacity, the weight capacity, and then the compartment configuration. So I think all these are set up to have four bulk compartments and one package compartment. So we can put both bulk and package products on here.

The right column has the profile that I want to use for this job. So it's going to be the start date is today's date. I can move that forward to make it the 11th. The earliest starting time is the earliest I want to schedule routes to start at. I'll say it's set for six; you can change this to any other time. The max work hours is the constraint we want to use. We don't want to create routes that are longer than this time. And then the max loads is the number of times we want to be able to load the truck. So I'm going to set this to three, and then I'll have to pick the terminals that we load from.

So these are the terminals that we've set up that are associated with the Atlanta bulk plant depot. And we can set up multiples, we can do up, we can do, I think this looks like it's set to a maximum of two loads. So one load and then one reload during the route.

And then we can set it up to optimize by speed. So fastest, distance, shortest, and conversion rate is a calculation of the cost of the route. So it gives us an indication of if you want to optimize by the cheapest routes or the lowest cost routes, then you can also select that as well. I'm going to leave it on speed.

And then down here at the bottom, balanced trips will try to create roughly balanced duration on the trips. So these should all come out to be roughly the same length of time. You can decide whether you want to use all trucks. So if I wanted to schedule the orders across all of these trucks, I could click that. If you want to see if you can get by with fewer trucks, then you would leave that unchecked. And if the system is able to, it will allocate the orders to fewer than the available trucks if it can.

The perform route optimization is a kind of additional optimization that you have the option to do. This is actually going to go away. This will just all be incorporated into the base job.

And then if you want to always fill your bulk compartments regardless of the quantities that are on the orders that are available, then we can also set this up so that it'll plan loads to fill the compartments.

So this is the setup. So based on the filter for the orders I selected, the trucks I want to route for, and then the parameters I want to route around, then I can go ahead and start this job. Now this will take a little while to run. Obviously multi-compartment routing is a pretty complex task.

So it'll run, it started running, you'll see up here it'll say it's adding orders to route, and this is all happening in the background. We've still got all of our unrouted orders displayed.

It is still in the process as long as it says adding orders to route, even though it cleared this screen out. It's still building routes. It's got an initial snapshot of what it thinks they'll look like, roughly for distance and duration. But you can see that none of the weights or volumes are populated yet, so it's still working.

And rather than sit here and watch this thing count, I'm going to go back and look at one that I had built for today and show you what the routing solution will look like once it's done. So that's the one that's still in process.

This is one that I had done earlier. Similar set of routes, similar set of orders that were planned on the same set of trucks we have as well. So orientation on this screen, these are the routes that have been planned and you can see for each one the truck is planned for, the number of orders, the number of loads and then the weight and volumes that are planned for the route.

Then the total distance for the route and then the estimated duration based on the setup. This is going to take into account prep time. There's a time on site to prep for making a delivery and then for each truck we'll set up the pump rate capacities for the truck. Depending on on the pump that's on your truck will set up different rates. And then depending on the quantities that are planned, we'll calculate the expected duration for making those deliveries. So all of that is taken into account in the estimated duration.

And you can see that—

Chris Henry

It looks like on this one, Doug. I mean, it pretty much made everything, I think this is what you're getting to. So everything was close to 10 hours, but not over.

Doug Hollowell

Yeah, yeah. So it did a pretty good job balancing. Looks like we're anywhere from seven and a half to nine and a half hour, just at right at 10 hours, actually here on the bottom one. From here, all of the routes and orders are plotted on the right. Can get a little hard to see if there are a lot of orders.

I think we ended up, I think there were 81 orders if I'm not mistaken in this solution. So I can show only expanded routes and take off the orders that weren't routed. And I'll talk about why they weren't routed and how we know why they weren't routed below.

So expanded routes over here for each route, there's a little icon, I can click on that, and expand that route to see the details of the route. So this one has one load at the Atlanta bulk plant, shows the start time, which we set to 6 a.m. for our default start time.

The plan weight versus the total weight capacity of the truck, the plan volume versus the total plan volume capacity on the truck, there's no package product on this truck, but if there had been then it would show us the similar number for that. We've got five orders on here and you can see here the the estimated time of arrival and delivery duration for each of those orders.

And if I want to see more detail about what's on those orders and I can click on the product summary here and it'll give me some information here about what was on this order, what's on the truck for the entire route, what compartments we planned those into, and then what the truck configuration looks like. So for each compartment one through four are bulk compartments so we've got a max weight, a max bulk volume for each of those and the fifth compartment is set up as a packaged compartment so we just record the weight for that.

And then so down here in the right these are the orders that did not get routed. So we've got 25 orders that didn't get routed and for most of these it looks like nearly all of them, it's because the trip was full. So if I click on one, it'll show that this one had 500 gallons of dye and 300 gallons of gasoline planned. Worth noting that when I sorted the orders or sliced the orders for what I wanted to route, I picked orders that had those products on it. They can also have other products as well.

And that's one of the configuration points that needs to be considered is how you want to handle routing multiple products to the same customer, whether you want to split those up across multiple orders or keeping them all in one order.

Charlie Petry

We got a question that came in. Will this process account for retain or does it assume empty trucks when you're starting?

Matthew Belk

For now, it assumes empty trucks and the reason for that is that we don't really know what the return is going to be because if you're routing and the trucks are still on the road, then we don't really have a good basis for knowing what they're going to come back with. So if the trucks are already all of the deep, yeah, I would say in general, we just assume an empty truck.

Doug Hollowell

So you'll see the reason code over here, why they weren't added, trucks were full, there were a couple down here, but we just ran out of truck space to put all the orders on. They just didn't fit on all the trucks. Some of these does not fit on any vehicle. I think these are, this is a 5,000 gallon dyed order and none of the trucks have a 5,000 gallon capacity. These were some transport orders that were included, so that's why they are not fitting on the tank wagons in this case.

And one other thing that can be useful here - there's a report that you can download that will show across the routes a little bit more. A little bit more information about what was planned. So, it planned a total of nine trips, routes, routed 83 orders, 10 loads across those nine trips, and then the average miles per stop is 17 and a half. So total planned miles across all of the trips is 1190. The total planned time is 82 hours, 52 minutes, and then the average capacity of the bulk assets. So we're able to plan orders for 87% of the capacity on the trucks on average.

And then down below for each of those individual nine trips, it shows the individual statistics for each of them. Some of these were the miles in time we saw on the other screen. I think a useful one here is the bulk capacity used. So you can see that it did a pretty good job of filling the trucks up anywhere from 77 to 97 percent of the capacity of the truck being used in this case. And this can be useful if you're looking at multiple scenarios.

So if you want to replan this scenario with fewer trucks or more trucks to make the deliveries, then you can see what impact that would have on the percent bulk capacity used on each of those trucks.

Chris Henry

There's a couple of questions that we have, maybe for first one from Matthew. Will the system do supplier allocation when loading?

Matthew Belk

We don't really have any, we have contract management and that kind of, that information is on our roadmap kind of globally, but no, currently we don't have any, we don't keep track of supplier allocation.

Chris Henry

That's on the roadmap and that's come in this year at some point. And then there's another one, will there be a report available that will show actual versus projected?

We already have that report. So it's in a different format, but yeah, we've got plan versus actual already from a recording standpoint.

We've got it, we're running tight on time. So, I don't know, are there other things in here that you'd like to show Doug, or you want to handle a couple -

Doug Hollowell

The only thing I'll mention is once you found a solution that looks good, so if we like the way it came up with a solution for this route, and I would just say save solution here, And that would move, it would create these routes in the route builder in Mobile Hub. And then that's where you would go in and start dealing with any exception.

So if you knew you had an order, you needed to add to a route or you need to swap an order out because of an emergency or something like that, then that's where the dispatcher would make those changes. So basically this is giving them their starting point for getting the orders routed and then they can deal with the exceptions once it's been put into the route builder and they can finalize everything.

Charlie Petry

We have another question. Will the system email customers with the estimated time of delivery or the advanced ship notification after it's finalized and rolled into the route builder as a finished route?

Doug Hollowell

Yes, so once it's in route builder, we won't send those notifications out until the dispatcher has reviewed the routes in there and made any other exception changes that need to be made. And then once they, we call it dispatching the route, that's when we'll queue up notifications to go out to customers. So those will go out sometime after all of the route planning is finished to let customers know what time they should expect their order.

Chris Henry

Let's hit a couple of more questions. So what is challenging, Matthew, if you want to answer this, what's so what's challenging about auto-routing with compartments and why is that a hard problem to solve?

Matthew Belk

Oh, my goodness, there's just so much computation that's involved. I mean, where do you start? And I'm not even the math guy in the company. We have a guy that sits in his own little cubicle that has figured out, who's figuring out all the math. But it's just the number of permutations is astronomical.

Once you get into a, we call them a matrix of stops, from, sources and destinations. Once you get it, once you get into a matrix that's more than 10 by 10, the number of the number of possible combinations of routes that you could potentially have to sift through is just astronomical.

So yeah, it's just, it's a very, very complex math problem. And that's one reason why traditional, like what we consider AI, like the ChatGPT-style LLMs, they're not really, they're not a good, you can't just pump in a hundred orders and 10 trucks and ask ChatGPT to route them. It doesn't work that way.

LLMs aren't really good at heavy-duty, computational things like that. They're great at spotting trends. They're great at sifting through the entire internet, all of the world's knowledge in the history of the world and coming up with answers to questions. But those questions are heavily computational. AI is not going to really be not going to help you out a whole lot with that.

Chris Henry

But we do have some AI ML background behind this, right? So our algorithm, you want to talk about what algorithms like?

Matthew Belk

Yeah, definitely. So at least for how to distribute products on loads, we use a genetic algorithm, which not to get too technical, but it takes a proposal, it starts swapping things in and out every generation. Hopefully it gets a little bit better. Generations that are not better are discarded. So you get a little bit of only the strong survive kind of thing.

As the routes evolve, as you add orders to them, you start, you keep swapping and swapping and swapping. And over time, with enough swaps like that, you hope to arrive at an optimal solution. So yeah.

Chris Henry

We have one more question. What are the criteria used for the conversion type of routing, so speed, distance, or conversion?

Matthew Belk

I'm not sure I completely understand the question, but the conversion rate is essentially cost-based. So if you assign a dollars per mile operating cost to your trucks and a dollars per hour kind of planning cost to your drivers, it'll attempt to kind of combine those two into one, one blended number up with the, so we can come up with the shortest route, we can come out with the fastest route, we can come up with the cheapest route is essentially you can kind of think of it in those three terms.

Charlie Petry

We have one more question, too. When wet-hosing, will the system estimate the delivery time based on the number of units?

Matthew Belk

Currently, it's based on the pumps' blended flow rate. So if you wanted to kind of build in those delays, like If you have a truck that has a maximum flow rate of however many gallons per minute, 50 gallons per minute, and that it's used primarily for wet hosing, then you might want to drop that down by a factor of 75 percent, right?

So you could build in that sort of truck-to-truck capability, moving the hose from truck to truck by artificially reducing the maximum flow rate of the pumps on the truck.

Chris Henry

I think part of this question, which we've heard before, is whether we ever go back and re-forecast order times based on historical data or the number of units that are there?

Matthew Belk

I would say that's in our that's in my personal roadmap is the inability to and that that would be a great way that way I think would be a great utilization for AI, right, to help us feed information like that, deliver history to customers, including the number of units, the gallons per unit, to figure out smarter setup times.

We've chosen to go from a flow rate standpoint - how fast can you move product versus how long are you typically on site? Right, I mean, that's two different ways you can treat that. I think one way to do it would be to set up the customer setup. We can define the common setup time for a customer.

You can incorporate the number of units into the customer service time and the base setup time. For example, if you're on a yard with 60 trash trucks to fill and it takes roughly 30 seconds to move between trucks on average, you could add an extra 30-minute service-time buffer to the regular customer setup time. You can kind of approximate it that way; you could use that as a proxy for the overhead of the unit fills.

Chris Henry

I think going forward, for some of the other technical aspects, could you give us a general overview of how this works? Is this available for on-premise customers? Not that we have very many of those left, but generally, how does this work and how does it scale?

Matthew Belk

So this is decoupled from the regular Mobile Hub ecosystem. It's a separate set of servers that are running. Our ultimate goal is to make this available publicly. With an API, you can make requests to it. Mobile Hub is one of the consumers of that API.

So that API handles requests. It publishes a message on a real-time message bus. We have an engine that runs continuously, listening for these messages. When it gets a message, it starts running a job. It posts back, publishes other messages back to the API at different states of the jobs completion. And that API uses web hooks to call into the calling system.

And we take that information and then use a tool called SignalR, that's a little bit getting in the weeds, to update the user interface that you see here on the screen in as near real time as possible. It's all based on .NET, we're a .NET shop, a Microsoft shop in general. It's all built on .NET 10, the latest Microsoft tech stack.

Chris Henry

We've got a couple of more questions from an interview standpoint, and then I want to make sure we get to any, any other questions from an open-question standpoint.

This is more on the rollout, so maybe more on the dug side, but how are we rolling this out? And so we've got existing customers, what's the process for that? And what skills do they need? Generally, what's our rollout process for this?

Doug Hollowell

Yeah. So, for rolling this out, we plan to start rolling out to some early access customers this quarter. We'll work with some of our existing customers on that front, and then make it more generally available in the second quarter.

The rollout process will be for the existing customers, we'll be building on what's already there, data-wise in Mobile Hub, and that you've been using for the route builder. We'll identify where and what other data needs to be updated. So anywhere we need to, whether it's product weights and densities, or any truck configuration or customer-related configuration, we'll identify where those gaps are at and help you come up with a plan for getting those filled in. Once we get through that, we can do training, start the rollout, and go live.

Chris Henry

So what skills does that customer need? Does a customer team need? What do you think they should have?

Doug Hollowell

I'd say for most people, it comes down to Excel skills. Really getting some data that you can get into Excel and fill in the data with our gaps and then we can re-import that data back into Mobile Hub.

Alternatively, if your data is already in Mobile Hub, you can update it on a customer-by-customer or product-by-product basis, but those numbers can get pretty big pretty quickly. So it can make more sense just to export everything, update the data in bulk, and then re-upload it. It's not onerous. I wouldn't say it's difficult. It just takes a little time to review and verify everything.

Chris Henry

And some of that, I think especially, obviously we have geocoding services, and we'll automatically geocode things, but a lot of it I think is around customer information, right, like what their delivery windows are, how long the setup is for each customer.

Doug Hollowell

Exactly, yeah. If you want to use cost-based accounting or cost-based routes, we need to know the cost of trucks, drivers, and related costs.

Chris Henry

Yeah. And they don't have to be exact, right? It's for planning purposes, right?

Doug Hollowell

Right, yeah, the goal is to get a good solution. I'd say somewhere between a good and a great solution, the enemy of the perfect is the enemy of good. So we don't need to get there.

And there are some, obviously very sophisticated systems that will get you the extra few percent that's out there, but it's the 80/20 rule that applies.

Chris Henry

Got it. We're right at the end, so if anyone has any questions, raise your hand. Charlie got through a bunch of them. I think eight of them were answered.

If no one has any, I always end with the lightning round. You can both answer one question, but my lightning round bonus question is: What's the craziest aha moment a customer shared after GoLive? Obviously, we haven't rolled out the auto-routing. So this is just in general. But what's the craziest aha moment a customer had for either one of you?

Doug Hollowell

I'd say we had one customer. We were going live. First day, literally within the first two hours of GoLive, a driver called in and said, hey, I'm trying to make this delivery. They had the nozzle in the tank ready to deliver, and it won't let me start this order. It says I'm outside the geofence, meaning they were outside the customer location. And they called back and couldn't start the

order. And obviously in Mobile Hub, there are some things we haven't placed to prevent delivering to the wrong customer.

And after a little bit of research, if we got it sure enough, the guy was at the wrong customer and was about to make a delivery into a tank for a customer that didn't even have an order for it. So, kind of surprising that it happened that quickly, but it wasn't the first time something like that had happened for them.

Chris Henry

What's one feature that most surprises customers?

Doug Hollowell

I would say the visibility on the route, the dispatch dashboard, and being able to see exactly what the status of every rowdy is summarized on one screen. You can see where the trucks are at. You can see what's delivered, what's not delivered, what orders look like they're going to be behind schedule for delivery and potentially missed, and just having that visibility, especially for somebody who's coming off of a paper system, can be a pretty big leap forward and pretty exciting.

Chris Henry

We didn't talk about AI that much in here, even though we've got AI powering our engine and some other areas, but if you could snap your fingers and instantly add either one AI capability, what would it be?

Matthew Belk

I would probably say leveraging its ability to spot trends. I think it would be great if we had, I'd love to have an AI agent that could be constantly monitoring trips in progress and being much more proactive about alerting, it could spot trends about whether or not a driver is doing the right thing in the right order or how close he is, how in jeopardy orders are downstream orders are to being late or to being delayed. So we can be more proactive to dispatchers about notifying them that, hey, you might want to get on somebody to hop to it or reroute orders, right?

If you had to pull orders off of a route because the driver just isn't, he got way later to stop, right? Anything like that that would be more proactive to help us. I mean, I would probably add that.

Chris Henry

We've got a couple other questions in here. Can you route off of the most efficient driver or can you route off of drivers instead of trucks? I think that's a coming feature, right?

Matthew Belk

Yeah, the routing off of drivers, at least adding drivers to the pool of assets that we're combining, right? You know, orders, trucks and drivers are definitely part of it. I would say we don't really have a way of storing the driver's efficiency yet. To, to, and I'm not really sure what the rules that we would use to govern who, which driver gets assigned to which, to which trucks or which routes. I'm certainly open to suggestions on how you might do that right now, and how we could encapsulate that knowledge.

That's a great example of the tribal knowledge that we're trying to figure out how to encapsulate. But that also seems to me to be very subjective and fuzzy and hard to put into a computational format, right? Where we can leverage it.

Chris Henry

Yeah, we've seen that. So that'd be an example of where you get, we don't have that in there now, but that'd be an example of where you get advanced routing where you can separate the planning cost from the actual cost. In advanced routing systems, you can say that you can plan for drivers because you don't want to have the most expensive driver, They'll end up not getting routes.

And so you can set the driver planning cost all at the same and then put the more experienced driver in there. But those are where you separate the plan from the actual, that'd be an example, I think of where you'd see some advanced routing solutions if you feel like you need to have that.

So obviously we'll continue developing ours, but I don't think that's in there right now.

Charlie Petry

Yeah, we have one more question. Will the delivery times update if the driver is delayed?

Matthew Belk

We do that from an operational standpoint as routes are started in the dispatch dashboard. We definitely will recalculate ETAs based on the RTAs and RTDs of drivers how they're performing the route during the route.

Chris Henry

So a couple more, two more lightning questions. One piece of advice for customers, existing or new customers, what would you give them when they start looking at logistic solutions and routing?

Matthew Belk

Don't underestimate how hard it is to make your data good.

Chris Henry

Then the last one: What's one area you see AI making the biggest impact in petroleum logistics?

Matthew Belk

I would say it's the ability to spot trends. If you can derive the right prompts, you can spot trends very easily, things that are not immediately obvious to a human. That, plus the ability to interpret the computer vision aspect of AI, is incredible. I mean, it goes way beyond just traditional OCR as we had 20 years ago.

And so I think being able to use AI to process documents, whether that's the PDF, an image of a BOL that a driver takes or even a pricing email that we get, or that you guys might get from your rack, your suppliers at the rack, they come in at all different shapes and sizes and different formats, being able to write some AI that can kind of standardize all that and then be able to feed it to us.

Chris Henry

Yeah, that's good. Well, we're right at the end of the time. I don't see any more questions. This has been good. Hopefully, this has been helpful for people. We will get the recording out. We'll clean up the recording and send it out so that you can watch it afterwards. You can also share the recording if you want.

But Matthew, Doug, and Charlie, thanks for doing this for the participants. Hopefully, this was good. Hopefully, you guys learned something. If you have any questions, please forward them to Charlie. Charlie will ensure we address any questions you have after this.

And obviously, we're looking forward, I would say, to rolling this out to our customers. That's a big step for us. We've got partners that are routing partners. We are not stepping on their feet. We understand that they are more advanced than what we do. But our goal, which I think Doug mentioned, was that we are trying to come up with a good route. As you get more advanced requirements, we have multiple options, but a couple of really good engines that can handle the more advanced side. But for what we see a lot of customers have, and if they don't have those advanced needs, this will be a great start for them.

So thanks for doing this. I appreciate you guys all doing it. Hopefully, this has been helpful. Thanks.

Matthew Belk

Thank you. Have a great day, everybody. Bye.

Doug Hollowell

Thank you.