Material Transfer Vehicles

ROADTEC®

an Astec Industries Company

Solutions

Material Transfer Vehicles Are a Must-Have Today

In the year 1935 Harry Barber launched his invention, the very first asphalt paver. As you might imagine roadbuilding was changed forever and for the better. Road paving technology would not significantly change again until 1989 when Roadtec's parent company, Astec Industries, introduced the very first material transfer vehicle, the Shuttle Buggy® MTV. Roadtec material transfer technology led the way to dramatically improved pavements, making Roadtec MTV's an essential tool for today's roadbuilders.

Shuttle Buggy material transfer vehicle

The Shuttle Buggy® MTV

The Shuttle Buggy material transfer vehicle (MTV) is designed to "shuttle" between the hot mix asphalt haul truck and paver. Segregation problems are eliminated thanks to the machine's remixing action. The Shuttle Buggy MTV also allows non-stop paving, which leads to a much smoother surface. The machine has a storage capacity of 25 tons (22.7 metric tons), allowing the contractor to smooth out his truck cycles and reduce haul costs. Truck unloading capacity is rated at 1,000 tons per hour (907 metric tons/hour) and paver loading capacity at 600 tons per hour (544 metric tons/hour).

MTV-1000 material transfer vehicle

The MTV-1000™

The MTV-1000 material transfer vehicle is a compact machine which transfers mix from truck to paver while reblending the material. Like the Shuttle Buggy MTV, the MTV-1000 is able to help roadbuilders solve material and temperature segregation problems. Reblending takes place at the transfer from truck unloading to paver loading conveyor. The machine allows continuous paving without stopping for refills from trucks. Paver loading capacity is rated at 600 tons per hour (544 metric tons/hour).

Both Roadtec material transfer vehicles, the Shuttle Buggy and the MTV-1000, help you build smooth, unsegregated, durable roads.

Don't let this be the result of your hard work.

Roadbuilders Rely on Material Transfer Vehicles from Roadtec

Roadtec is the material transfer expert when it comes to paving. That's why Roadtec material transfer devices are the only viable solution for road builders worldwide, and their value is being recognized everywhere. Only Roadtec offers you machines that truly remix and give you reliable results time after time. Roadtec experience combined with unique features are simply unmatched. We brought you the first MTV and we have continued to perfect the technology to bring you the current generation of machines.

The Problem that Led to the first MTV

When pavement failure began to be studied more closely in the 1980's, it was found that one of the most important causes was material segregation.

This discovery inspired our engineers to find a solution: a device that could re-mix hot mix asphalt just before feeding it to the paver. The result was the first Shuttle Buggy MTV. With the help of a Shuttle Buggy MTV, road builders were now able to eliminate material segregation for the first time ever.

Temperature Difference Surprise

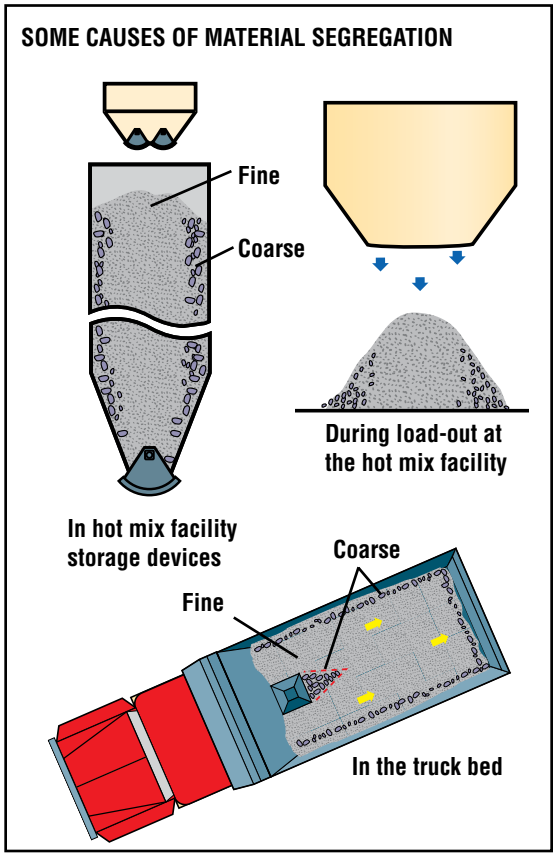
Our research & development staff looked at hot mix at the job site with an infrared camera. They saw a surprisingly large temperature differential in the mix, with some areas of the load as cold as 210°F (99°C)! And the mix had not been hauled a great distance.

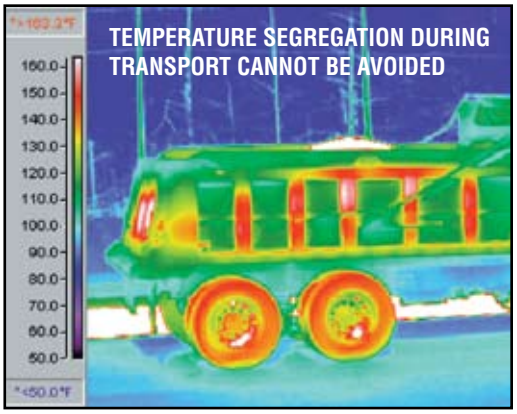
Non-uniform compaction, raveling and stripping could be traced back to temperature differentials in the mix. The good news was that the Shuttle Buggy MTV with its re-mixing action could eliminate differences in mix temperature, just like it eliminated material segregation.

Important Side Benefits

Roadtec has sold hundreds of Shuttle Buggy MTV's worldwide. Many of our customers have been able to reduce their trucking costs because of the Shuttle Buggy MTV's ability to eliminate truck delay.

Not only does the Shuttle Buggy MTV dramatically improve pavement quality, it can also help make your paving operation more efficient. Find out more on the following pages.





Infrared image of loaded truck with insulated truck bed. Note the temperature loss through the uninsulated tail gate. Without remixing, the colder material will screed out together and form a potential trouble spot.

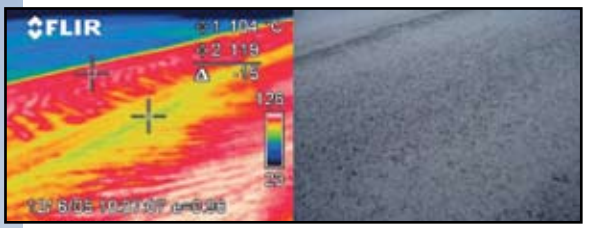
Hundreds of Shuttle Buggy MTV's are in use all over the world: in 46 U.S. States, in 20 countries, on 6 continents.

Solutions

Remixing

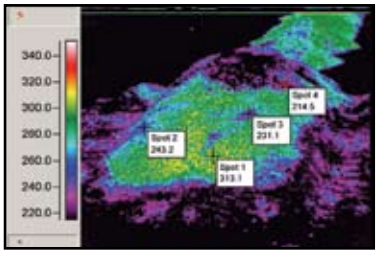
Roadtec Gives You Control Over Segregation

Segregation in hot mix asphalt can ruin the quality of your work. Yet the things that cause the segregation, like less than perfect stockpile management at the hot mix plant or long truck wait times, are often out of your control. But you can fix it. Remixing hot mix just before it is placed can eliminate material and temperature segregation. With Roadtec's material transfer technology, you can count on thorough remixing that redistributes all the material evenly.

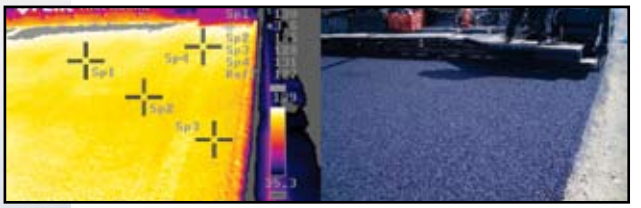


The infrared photo shows temperature differentials. The poor quality of the pavement is easily seen.

Even this mix can make a good pavement if it is run through a Roadtec MTV.



Windrows typically have temperature differentials of more than 100°F (38°C). Even temperatures can be restored with a Roadtec MTV.



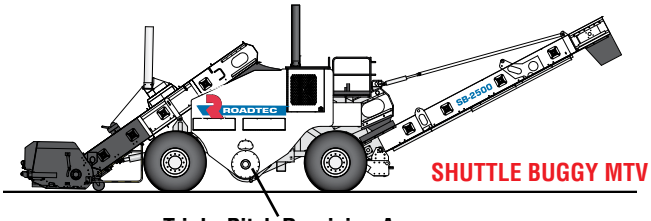
Minimal color variation in the infrared image indicates minimal temperature difference in the mix, a result of good remixing.

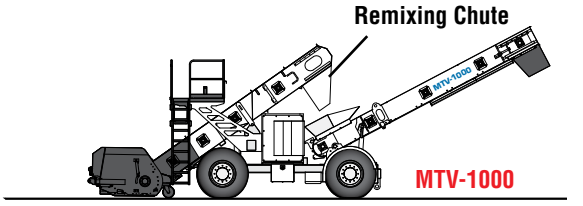
Why Segregation is a Problem

Pavements that have either aggregate or temperature segregation will have areas where the mix has either poor structure, poor texture, or both. The mat will not have uniform density and the surface will fail prematurely. *Compaction will not fix either temperature or material segregation.*

Roadtec Offers Two Solutions

The Shuttle Buggy® MTV and its compact cousin, the MTV-1000™ both offer exclusive Roadtec remixing technology and heavy-duty construction. The Shuttle Buggy MTV also gives you 25 tons (22.7 metric tons) of storage capacity in the form of a surge bin located at the center of the machine.





When it Comes to Mixing Augers, Only Multi-Pitch Flighting Does the Job

The reason why single-pitch augers won't remix is simple: Single-pitch flighting pulls material primarily from the sides of the bin. The spaces between flights fill up and the auger just tunnels through. The contents of the bin are not remixed, and therefore segregation remains a problem. Single-pitch augers are fine for some applications but not for remixing hot mix asphalt.

SHUTTLE BUGGY® MTV MIXING AUGER FLIGHTING DESIGN

GOOD Triple-pitch used in Roadtec Shuttle Buggy MTV's

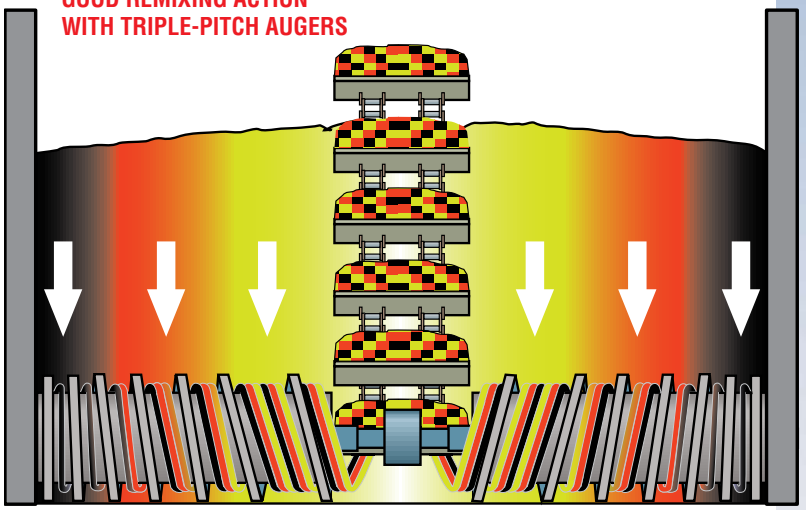
POOR Single-pitch

Remixing

Shuttle Buggy MTV Remixing

Remixing augers with increasing pitch provide uniform flow across the entire width of the bin. They draw material down evenly across the whole bin and therefore all the material is remixed very thoroughly. Single-pitch augers tend to tunnel through material and draw only from the sides of the bin. Roadtec Shuttle Buggy material transfer vehicles use an exclusive triple-pitch auger design. This exclusive Roadtec advantage is key for achieving the best mixing results. It's why you'll be able to meet the tightest temperature segregation spec with ease when you use a Roadtec Shuttle Buggy MTV.

GOOD REMIXING ACTION
WITH TRIPLE-PITCH AUGERS



The Shuttle Buggy MTV Surge Bin

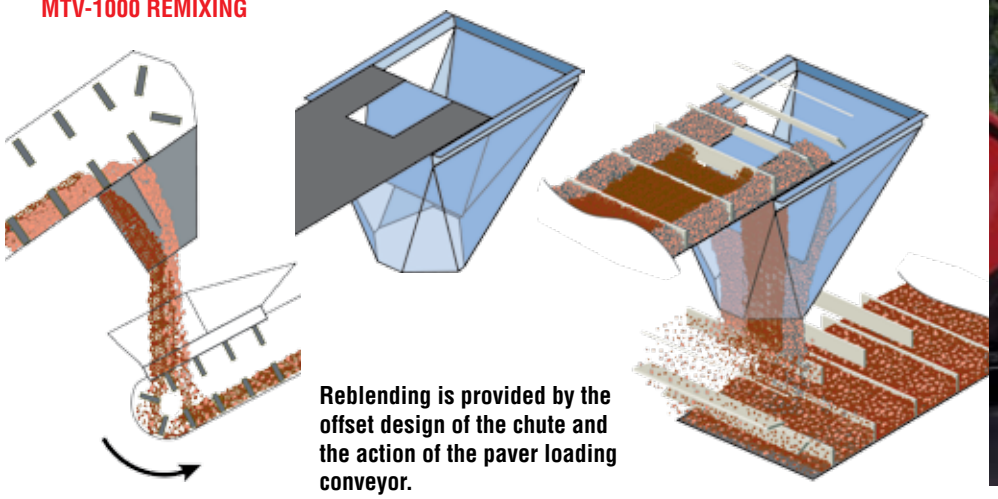
Contents of the Roadtec Shuttle Buggy MTV's 25-ton (22.7 metric tons) storage bin are constantly mixed by the triple-pitch auger located in the bottom of the bin. The mixing action equalizes temperatures and evenly mixes large and small particles. A slat conveyor runs from the bottom of the bin and feeds the paver. Heat sink characteristics of the storage bin further help combat temperature segregation.

The Shuttle Buggy MTV continues to feed the paver while trucks are on their way. A 25-ton (22.7 metric tons) surge bin makes it possible.

MTV-1000 Exclusive Offset Gravity Transfer Assures Homogenous Mix

The MTV-1000 uses the transition between the truck unloading and the paver loading conveyors as a remixing point. Larger aggregate that may have rolled to the sides of the conveyor as well as cool spots in the mix are re-distributed throughout the mix.

MTV-1000 REMIXING

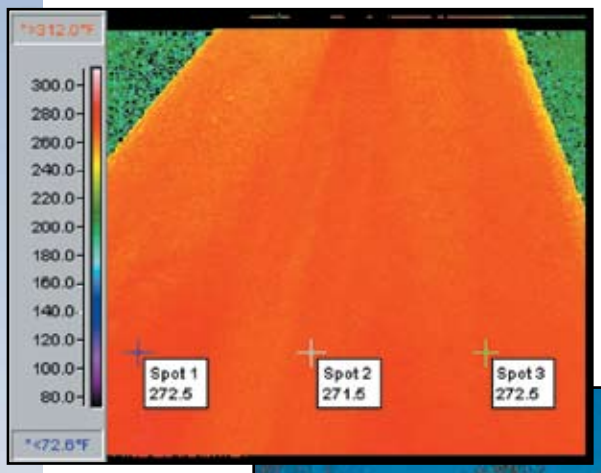


Reblending is provided by the offset design of the chute and the action of the paver loading conveyor.

Infrared Analysis

Roadtec Remixing Technology Delivers

Infrared images show the quality of remixing that takes place with different devices. Time after time Roadtec machines have been shown to perform far better than others. Roadtec mixing technology is better engineered and achieves superior results.



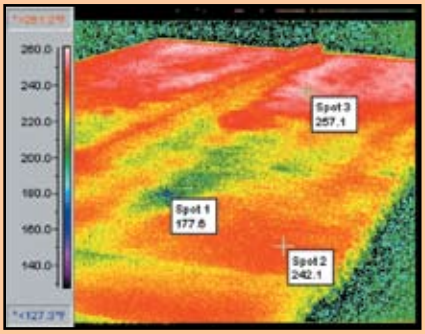
Real Job site Pictures Prove It

Infrared images were taken behind the actual machines pictured. Color variation in the infrared photos show temperature differences. Uniform density cannot be achieved when mix temperatures vary. Cold spots become pot holes.

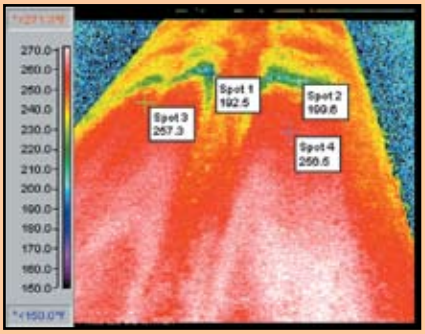
Virtually no temperature difference. Roadtec Shuttle Buggy.

Infrared Studies

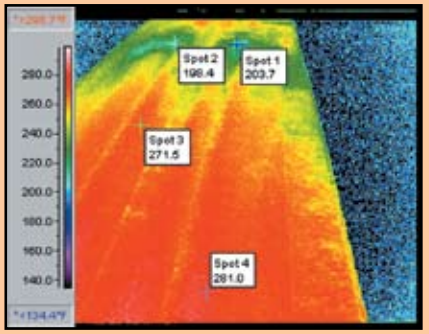
Windrow Pickup Machine



Windrow Pickup Machine with Truck Dumping Head



Remix Paver with Auger Feeders



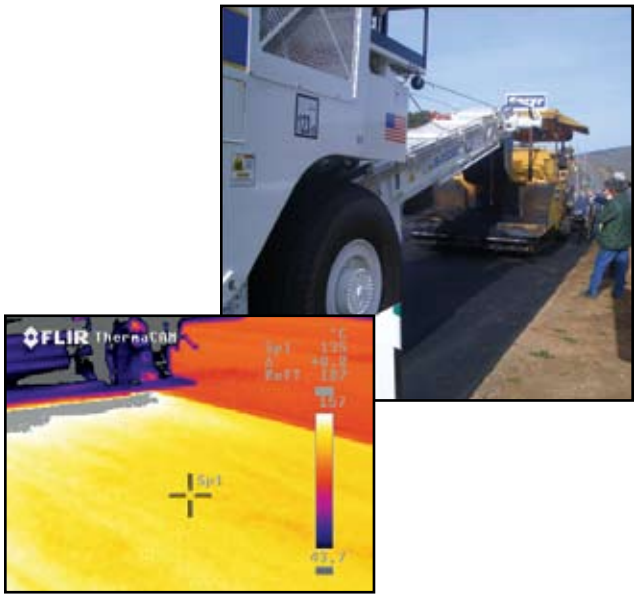
No other device combats segregation like the Shuttle Buggy MTV. No other d

Side-by-Side Test in Spain

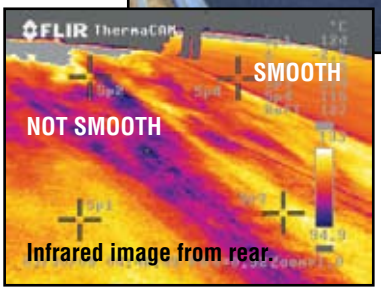
Sacyr, a European construction firm, put the Shuttle Buggy MTV to the test running two pavers side by side. One paver was fed with the Shuttle Buggy MTV, the other by truck. Results from this and other tests like it have increased Roadtec Shuttle Buggy MTV sales in Europe.

Improve Results for Any Paver

After the images on the right were taken, the Shuttle Buggy MTV was re-assigned to the other paver. Running with the Shuttle Buggy, the paver that had previously laid a segregated mat was now placing mix that had no sign of temperature segregation. See below.

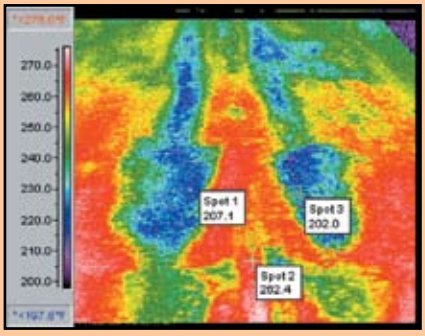


When the Shuttle Buggy was switched to the other paver it too provided temperature segregation-free results.

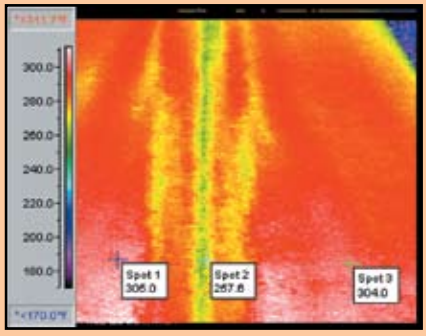


Corresponding rear view infrared image. The Shuttle Buggy MTV mat is visible in the upper right quadrant.

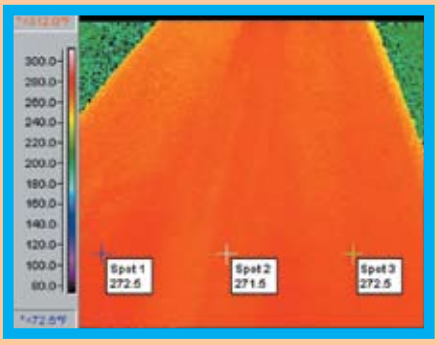
Belt Conveyor Type Material Transfer Vehicle



Belt Conveyor Type Material Transfer Vehicle with add-on pugmill



Roadtec Shuttle Buggy MTV



levice can help you meet and beat spec every time like the Shuttle Buggy MTV.

Infrared Analysis

Trucking Savings

How to Cut Costs with a Roadtec Material Transfer Vehicle

Good planning is a key ingredient to efficiency and profitability. Another necessity is having the right tools for the job. With a Shuttle Buggy® MTV you can drive profits on every job because you'll need fewer trucks. The Shuttle Buggy MTV provides on-site mix storage and can eliminate the delays that happen at the paver when the empty truck pulls away and the next full truck is moved into position.

The Shuttle Buggy MTV keeping the paver supplied with mix and moving non-stop.

SAMPLE TRUCK CYCLE CALCULATIONS		
	NO Shuttle Buggy MTV	WITH Shuttle Buggy MTV
Delay at Plant	0 min.	0 min.
Loading time	1 min.	1 min.
Ticket, Tarp & Sampling	5 min.	5 min.
Haul to Job	20 min.	20 min.
Delay at Job	15 min.	0 min.
Truck Exchange	2 min.	0 min.
Dump	3 min.	2 min.
Return to Plant	20 min.	20 min.
Total Minutes per Truck Cycle	**66 min.**	**48 min.**
Cost per Truck Cycle	$66.00	$48.00
Cost per Ton	$3.30	$2.40
Cycles per Truck	9	12
Cycles required	120	120
Number of Trucks Required	**14**	**10**

Example assumes: 10-hour workday. Mix usage rate 2,400 tons per day. 20-ton truck capacity. Truck cost $60/hr = $1.00 per minute. Distance to hot mix plant 10 miles.

Use the job calculator on our web site to run the numbers on your projects. Go to roadtec.com and click on "Software."

Your Goal is Continuous Paving

Keeping the paver moving makes sense not only from an efficiency point-of-view but also contributes to the quality of the mat. Whenever the paver stops, the screed has a chance to settle. The head of mix cools, creating a bump in the mat when you get moving again. And whenever a truck backs up to unload into a stopped paver, there can be another bump. All that shows up in the smoothness readings.

Keep Trucks and Paver Moving

To have three or four trucks waiting to unload at a job site where there's no Shuttle Buggy MTV is not unusual, but it's unnecessary and costs money.

A wait time of 15 minutes per truck at the job site is about average for most jobs where no Shuttle Buggy MTV is used. Even if you calculate only a very conservative cost of one dollar per minute of truck time, that's $15 extra you pay for each truck every time it's delayed for 15 minutes at the job site.

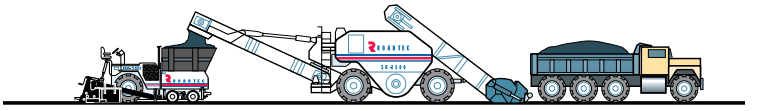
How to Maximize Storage Capacity

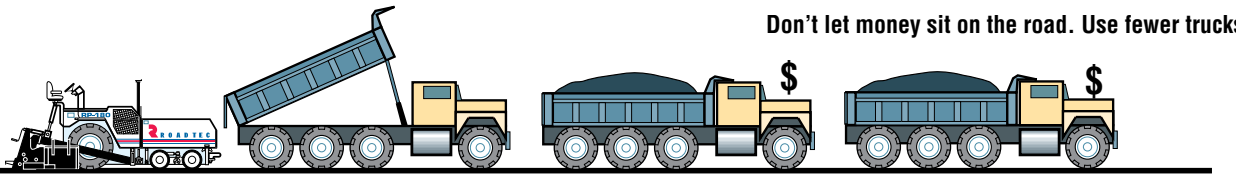
The Roadtec Shuttle Buggy MTV has a 25-ton (22.7 metric tons) storage bin. Add an insert to the paver and you get another 10-15 tons (9-14 metric tons) of capacity, sufficient for non-stop paving.

Trucks can be stopped 100 or 200 feet (30 or 60 meters) away from the paver and dump safely into the Shuttle Buggy MTV without moving. Being able to unload without moving also makes it possible to use bigger trailers, thus even further reducing the number of trucks needed. However, even with regular dump trucks you can cut your trucking cost when you use a Shuttle Buggy MTV.

Fewer Trucks Are Needed

If you can create a buffer of material at the job site by using a Shuttle Buggy MTV, you won't have to use trucks as storage bins to keep the paver supplied with mix. The example in the table shows how you can reduce the number of trucks needed by eliminating truck delays at the job site.





Don't let money sit on the road. Use fewer trucks.

Versatility

Intersection Pay-off

Intersection work is typically slow, and getting trucks to the paver is often difficult. Improve the maneuverability of your pavers on intersection work by freeing them from trucks with the help of a Roadtec MTV. One customer reported having cut the number of trucks from 7 to 3 while doubling the number of intersections completed in a work day with the use of a Shuttle Buggy MTV.

The windrow pick-up option adds to the Shuttle Buggy MTV's versatility.

Make Tricky Commercial Work Easy

Parking areas that have a lot of islands or peninsulas are difficult to pave. It's often impossible to form a good paving train and get the material in front of the paver. When you have a Shuttle Buggy MTV the truck can unload at a convenient spot. The truck can even dump onto the ground because the Shuttle Buggy with a windrow head can pick the material up and bring it to the paver.

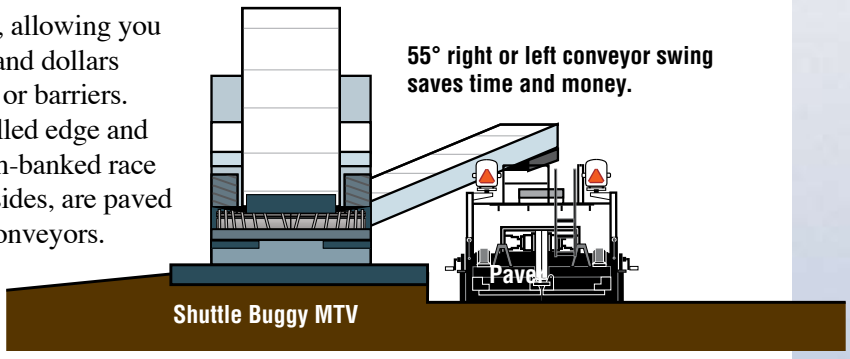
Low power lines can get in the way of raised dump truck beds. They're no problem with a Shuttle Buggy MTV.

Speed Up Handwork

Sometimes you'll have spots where you can't get a paver in, no matter what, and handwork is required. Roadtec MTV's are able to carefully dispense material to the workers exactly where they need it because the discharge conveyor can be lowered and pivoted from side to side.

Only Roadtec Gives You Pivoting Discharge Conveyors as Standard

The discharge conveyor swings 55° right or left, allowing you to do offset paving and to save significant time and dollars when adding lanes, or working with string lines or barriers. This feature also lets you keep trucks off the milled edge and off the tack coat. Specialty projects, such as high-banked race tracks or airports requiring string lines on both sides, are paved much easier with Roadtec's standard pivoting conveyors.



Features

Roadtec MTV Experience Pays off for You

MTV's lead a tough life. They're subject to getting bumped by trucks and by pavers, they get 16 plus tons of hot mix dumped into them in less than a minute, they keep the abrasive material moving and mixing, and they feed the paver at rates up to 600 tons per hour. Materials and workmanship must stand up to those demands. With Roadtec you'll get heavy-duty design you can rely on, coupled with the functionality you need.

Our wear parts are heavy-duty and guaranteed.

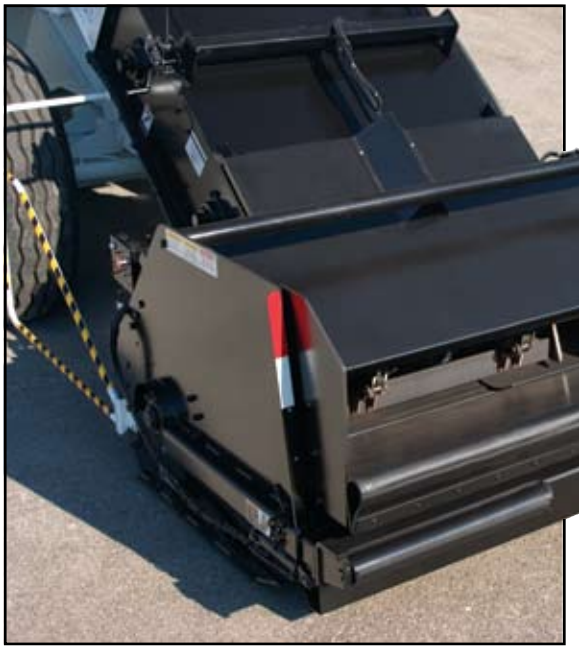
Have the Security of a Wear Guarantee

All chains, sprockets, liners, bearings, as well as the remixing auger are warrantied up to 250,000 tons (227,000 metric tons) or 1,500 hours of operation.

Moving Parts Made for Durability

All conveyors are outfitted with durable roller bushing chain. Slats are made of abrasion-resistant steel, and we install thick wear plate linings on the conveyor floors. No rubber conveyor belts in this tough environment!

The floor of the paver loading conveyor is insulated against heat loss. Rails installed at the bottom of this conveyor help protect it from any damage that could be caused by impact with the paver.

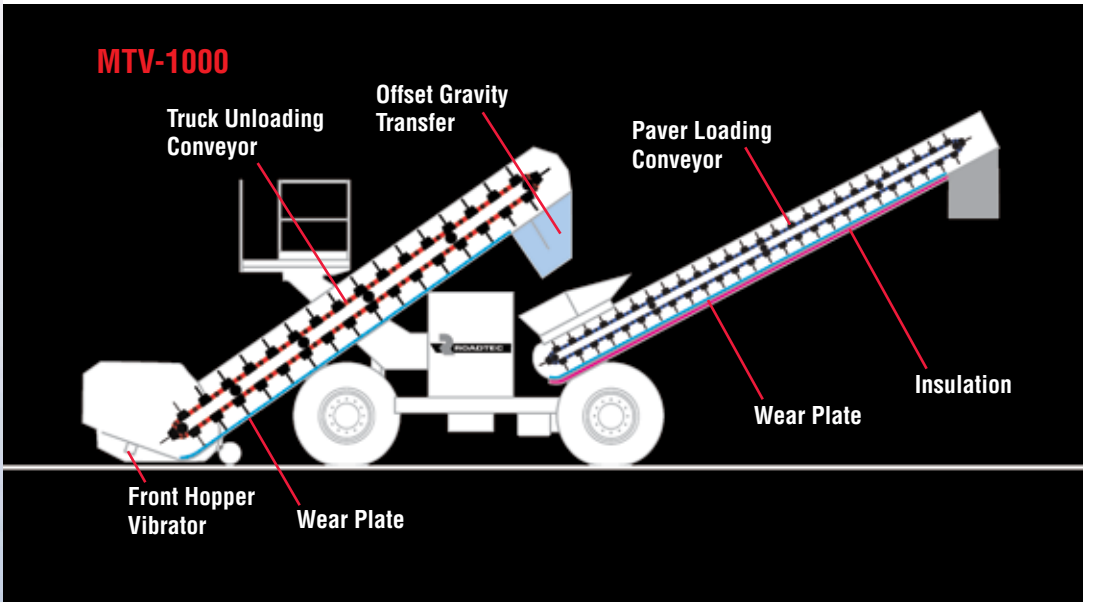


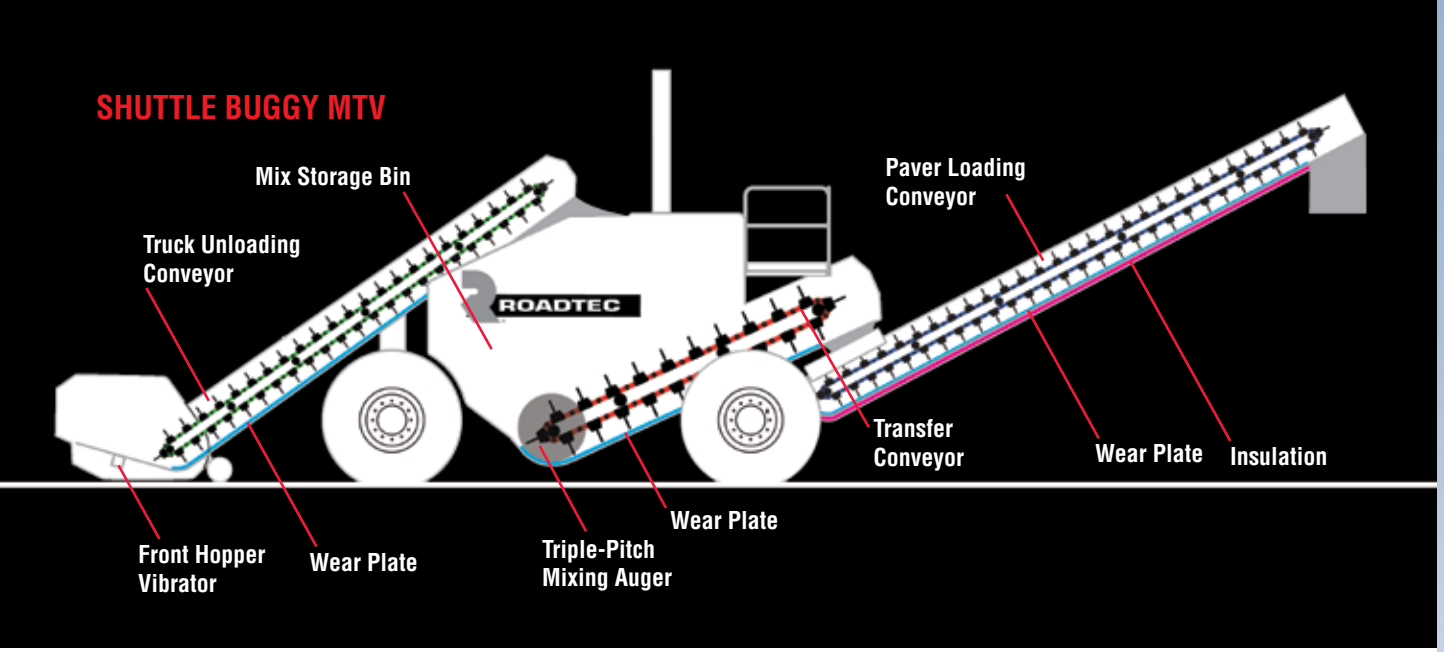
Front Hopper Performance Features

Sized for mass discharge from standard haul trucks, the front hopper lets trucks unload fast. A vibrating bottom plate in the hopper prevents material build-up.

Heavy-duty, swiveling support casters under the hopper assure smooth movement. Ground operators can adjust the hopper position from either of two separate control boxes. They can also adjust the position of the push roller for different truck designs.

Material flow to the truck unloading conveyor can be regulated by adjusting the position of hydraulically operated baffles in the intake hopper. The ground crew also has access to an emergency shut-off switch.





Features

Engine Meets Latest Emission Specs

A Caterpillar 300 hp diesel engine powers the Shuttle Buggy MTV and the MTV-1000. The 8.8 liter, 6-cylinder engine delivers plenty of power while meeting stringent tier III emission limits.

Better Maintenance Access

Maintenance access is a major goal in all our designs. Engine access is gained by hydraulically lifting the one-piece hood. There are hinged access doors that make the oil cooler, radiator and pumps easy to reach. Hydraulically operated clean-out doors are found at each conveyor. And your mechanic will really appreciate the remote lube points for all the conveyors. They're all accessible from the outside of the machine. An automatic lubrication system is available as an option.

Drive Features

The Shuttle Buggy MTV rides on four 21:00 x 25" high flotation tires, and the MTV-1000 uses a 17.5:00 x 25" tire size. The steering wheel controls the front wheels of the all-wheel drive machines. The hydrostatic drive mechanism offers two speed ranges (working and travel) with continuously variable speed control.


Hydraulics effortlessly raise the engine compartment hood.


Easy access to radiators.


Clean-out doors on all conveyors.

External lube points for all bearings. Auto-lube is optional.

Features

Standard Features Include Knowledgeable Product Support

You can expect that your Roadtec MTV comes with everything you need to get to work, plus a dedicated parts and service organization to help you get the most out of your machine. Roadtec service and parts departments can be reached by phone 24 hours a day, 7 days a week.

50 foot (15.25 m) long wash-down hose is standard. Longer ones are available.

More Safety and Convenience Features

Roadtec MTV's are equipped with a telescopic flashing amber beacon and a mirror package. The beacon calls attention to the machine from a long way off and the mirrors are used by the operator to see both sides of the machine. Safety brackets at the front of the machine keep personnel from entering the area between the tires and the front hopper. Safety bars at the operator station prevent falls. Emergency shut-off switches are found at ground level and at the main operator stations.

The sun shade umbrella supplied increases operator comfort. A wash-down system is provided and includes a 50-foot retractable hose. Longer hoses can be supplied. Tanks to hold special wash-down solutions can be installed.

Operator Stations on Right and Left

Depending on the job, the operator occupies the right or left station. The control panel swivels for use with either side. FXSTM fume extraction system comes standard.

The control panel swivels and can be used from the right-hand or left-hand operator station.

Windrow Head Adds Versatility

You can order your machine with a windrow head instead of a hopper at no extra charge. Windrow heads are also sold separately as an option. They include oscillating pivots for the front conveyor; hinged, hydraulically controlled right-hand and left-hand caster wheels; spring-activated end gates; and material plow.

Sun shades and mirror packages are supplied.

Shuttle Buggy MTV with windrow head.

All Options Are Available for the Shuttle Buggy MTV and the MTV-1000

AUXILIARY POWER
4KW 60 Hz Continuous Duty Hydraulic Generator
4KW 50 Hz Continuous Duty Hydraulic Generator
ADDITIONAL LIGHTING
Road Light Package – Includes Six 12 V Road Lights and Warning Beacon
Premium Light Package – Includes Five 500 W Halogen Lights,
Warning Beacon and Four 120 V Outlets Mounted At Machine Corners
MASS FLOW HOPPER INSERTS
Low Profile Hopper Insert for RP 150 Pavers
Low Profile Hopper Insert for RP 155 Pavers
Low Profile Hopper Insert for RP 190 Pavers
Low Profile Hopper Insert for RP 195 Pavers
Low Profile Universal Hopper Insert (fits most pavers)
Low Profile Custom Hopper Inserts
Mass Flow Hopper Side Wall Extensions
MISCELLANEOUS
Lincoln QuickLub Automated Lubrication System
Truck Hitch Instead of Push Rollers
Release Agent Spray-Down System – Includes 32 Gallon Tank, Pump, Retractable Hose Reel with 50’ Hose Length (Replaces Standard Wash-Down)
Windrow Pick Up Head Instead of Dump Hopper*
Windrow Pick Up Head Assembly as Spare*
* Windrow Head Includes Oscillating C-1 Pivot, hinged, hydraulically controlled right-hand and left-hand caster wheels; spring-activated end gates; and material plow.

Options

Options

You Can't Go Wrong with Roadtec

Over the years the Shuttle Buggy MTV and MTV-1000 have been fine-tuned and upgraded. Today's models offer the best combination of capacity, mobility, and performance. A solid set of standard features is complemented by a range of options to choose from. Roadtec MTV's are the best-performing material transfer vehicles available today because nobody has more material transfer experience than Roadtec.

Mass flow hopper inserts for your paver are available.

Lincoln QuickLub® automated lubrication systems are offered.

Choose from a range of light packages for night work.

Windrow heads can be supplied instead of a front hopper or in addition to one. Change-out time is 4-6 hours.

Please see the table on the previous page for a complete list of options.

Shuttle Buggy MTV with optional premium light package.

Shuttle Buggy® MTV


MTV-1000 compact material transfer vehicle


Shuttle Buggy MTV non-stop paving

ROADTEC an Astec Industries Company
800 MANUFACTURERS RD • CHATTANOOGA, TN 37405 USA • 800.272.7100 • FAX 423.267.7104 • roadtec.com