



Four Most Important Considerations in Purchasing an AGV/AGC System

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1. **“Acquiring an AGV system is NOT a one-time investment”!!!**

Although the **Purchase Price** and any detailed breakdown are easy to compare, they can be quite misleading if **Cost of Ownership** differences between vendor offerings are not also compared.

- **Equipment Lifespan Cost Expectations**
 - Savant provides equipment and technology that, with proper maintenance, should have a 20 year lifespan. Lifespans of less robust, less expensive offerings can be as short as 4 or 5 years after which their vehicles must either be replaced or undergo major overhauls.
 - That would basically mean over a 20 year life a customer would effectively have to buy our system once and one of these others as often as 3 times.
- **Path and Equipment Maintenance Costs**
 - Savant’s ‘Tape/Target-free’, virtual path is maintenance-free.
 - This saves customers tens of thousands of dollars over the lifetime of a system when compared to high-maintenance tape type floor paths.
 - In addition, laser/target path technology requires regular cleaning of the vehicle’s rotating laser sensor not to mention replacement (at a cost of about \$9,000 per vehicle) every 3-5 years due to its finite life. The Savant inertial sensor is 100% solid state (no moving parts) and therefore has no periodic replacement requirements.
 - Over a typical system use lifetime, path maintenance and laser sensor replacement costs can easily increase *Cost of Ownership* by more than 30% compared to Savant’s technology.
- **Costs of Changes over System Lifetime**
 - AGV/AGC systems almost never remain unchanged during their use lifetime.
 - The cost of changing a tape guided path includes removing old tape, prepping floors & labor-intensive laying down new tape as well as, moving/removing infloor vehicle code devices.
 - Laser/target path technology is totally dependent on maintaining 100% ‘line-of-sight’ to wall, rack and column mounted targets. If line-of-sight is interrupted, even for a few seconds, with any of the 3 targets the vehicle needs to see to navigate, the unit stops. This leaves these systems vulnerable to target blockage issues caused by inevitable facility and equipment arrangement changes that customers make in their facilities over time in areas where the laser vehicles operate. There are always unexpected costs with relocating targets to resolve target line-of-sight issues. The laser navigation targets require surveying so that their locations can be accurately placed on the CAD map the AGV follows. The costs of resurveying targets that have to be relocated for line-of-sight purposes can be quite expensive.
 - Savant’s inertial path technology is dependent only on a single small magnets periodically spaced in the floor. Although these magnets must be surveyed as part of the system installation (like laser targets), there are no line-of-sight/blocked target driven issues that would require their relocation and associated resurveying costs.



- **Obsolescence Costs**

- AGV/AGC system applications are typically expected to remain operational for at least 10 years, but it is not unusual for the processes they support to exist 20 or more years. Depending on the vendors' technology, its source and their business profile, obsolescence can become a serious problem/cost for customers.
 - Tape and laser/target AGV/AGC technologies are typically acquired from 3rd party controls suppliers. This allows a vendor to 1) quickly offer an AGV/AGC product by just fitting these controls to simple design vehicle chassis and, 2) lower their costs by not having to maintain a technology staff for vehicle core controls technology. Since these suppliers do not own their own controls, they can't adequately protect their customers from costly controls obsolescence. It is not uncommon for their customers to experience increasingly costly parts repair/replacement support and technology obsolescence problems 5-10 years after initial purchase.
 - Savant develops, maintains, and owns its core AGV/AGC technology including navigation, system and vehicle controls along with all the critical software architecture. Not outsourcing core technology to 3rd parties insures our customers that parts and technical support remains available much longer than would otherwise be possible. We have customers still running systems that are 25-30 years old. Although the technology supplied 30 years ago is no longer offered, because it was Savant developed technology, Savant can still provide parts and service support to mitigate unavoidable obsolescence issues. 3rd party control system suppliers would have long ago terminated support for 20 or more year old technology leaving AGV/AGC companies who provided systems based on that technology without an option for their older customers.

It is easy to compare vendors based on based on Initial 'Purchase Price', but this critically overlooks the 'Costs of Ownership' over a typical 15-25 year application lifespan (outlined above). Purchase and Cost of Ownership costs added together will often result in a dramatically different, but much more truthful comparison of vendors result.....by which, Savant's AGV/AGC system become the far lower customer cost option.

2. You can see product but you can't see technology

- Yet, understanding technology, not just how it works but what that means to users in day to day operation is perhaps the most critical factor for a successful system. If users don't like it.....they don't use it properly. Every AGV supplier uses different technology. Some license it from a 3rd party and are constrained to how they can apply and change it. Others develop and own their own technology and therefore have the full control to apply and change it as required by customer application and user needs.
- Evaluate technology very carefully by pretending you already have a system from each vendor being considered. Then ask the 'what-if' questions to truly understand how that technology impacts typical day-to-day user events. "What if I have to remove or reenter a vehicle from/into the system.....what do I have to do?" "What can shut down the system and what do I have to do to recover?" "Is path maintenance required and how easy is it to change the path or move stations?". "How 'user-friendly' (forgiving/unforgiving) is the AGV system?.....are there more or fewer rules for users to follow"? (more rules=more chance for accidental or intentional operator problems affecting system uptime/performance). The end goal is user acceptance and these considerations factor heavily into this especially in a production process.



3. Is AGV the supplier's core (main or only) business?

- Consider this an important factor because it can indicate the quality of support you receive. Typically when AGVS is not a core business, the supplier may not always be able to rectify a problem quickly or fails to appreciate the urgency. When AGVS is a core business it usually means the supplier owns and develops their own product and technology so they have the engineers, software and service people capable of expert support for any system hardware or functional issues.
- How much a supplier truly values customers is affected by whether AGVS is their core business or not. It is simply true that ***"If AGVS is your business, then your customers are your business."*** Every customer has experienced good and bad supplier relationships and knows that some bad experiences are because they are not important enough to the supplier. When AGVS is the supplier core/only business, they know that their business (livelihood) suffers if they don't take best care of their customers.
- Look 'down the road' at what you might do with your system. AGV core business suppliers are typically more focused and better positioned to insure any AGV parts or technology obsolescence issues are routinely addressed. This is important 5 or 10 years down the road or when you need to make significant changes or even relocate your systems. Will that technology be well supported years from now.....look at supplier history and business profiles carefully.

4. Customer – supplier relationships are the ultimate determinant for overall customer satisfaction with their systems.

- When problems occur, it will be the quality of supplier relationship that plays a critical role for how responsive and effectively those issues are resolved.
- Every supplier handles customer relationships differently. The supplier's business profile (core/non-core, technology ownership, history, customer base, etc.) has shaped their customer relationship approach and abilities. Assess your comfort level with your assessment of each supplier's unique relationship approach. Does their management team have good AGVS experience that provides a critical real world appreciation of user concerns and needs? Do you feel confident that you can contact this management at any time and receive the highest level of attention to your needs?