Pony.ai and the Autonomous Vehicle Industry

An analyst and a former general counsel at Pony.ai discussed the autonomous vehicle industry, regulatory landscape, competitive positioning, and operational challenges faced by AV companies, with particular focus on Pony.ai's technology, expansion strategy, and the broader market dynamics.

Expert Background and Career Trajectory

The expert is a lawyer who began their career at a large New York law firm doing litigation work for approximately eight years. Seeking to pursue the tech industry dream of becoming an in-house lawyer for a major tech company, they took their first in-house position with Kia Motors in Southern California in 2017, remaining there for two years.

Around 2019, Pony.ai emerged as a promising autonomous vehicle startup seeking their first lawyer. At the time, Pony had already completed a substantial seed round and Series A, raising approximately $300 million. During the interview process, the expert was shocked to learn the position was for the company's first lawyer, wondering how they had accomplished so much without in-house legal counsel. The expert ultimately joined and was based in Fremont, California, which serves as Pony's U.S. headquarters.

In 2019, Pony was conducting extensive autonomous testing on public roads in both California and China, which represented one of the main draws for the company and potential investors. The experience was akin to a rocket ship—within the first three to four months, they closed their biggest funding round, a Series B led by Toyota Motors with approximately $400 million from Toyota alone. The expert's original title was director of legal, but based on these accomplishments, they were promoted to the company's first general counsel.

The expert remained at Pony for three and a half years, responsible for all U.S. legal issues and essentially all international legal matters. While Pony had an in-house lawyer in China handling day-to-day Chinese compliance, permitting, and purely domestic commercial matters, the expert oversaw anything with an international dimension. Their work included navigating California's very stringent autonomous vehicle regulations and dealing with NHTSA (National Highway Traffic Safety Administration), the federal regulator with safety oversight over motor vehicles, which was beginning to wade more deeply into autonomous technology regulation during that period. The expert departed Pony in early 2023.

Post-Pony Career and Industry Engagement

After leaving Pony, the expert joined ArentFox, a large law firm, as part of their automotive group. The firm's goal in bringing them aboard was to build an autonomous vehicle and advanced mobility practice, though the expert also found they preferred law firm practice after discovering the in-house tech lawyer role wasn't exactly what they had expected. The legal industry is fundamentally a services industry focused on client relationships and revenue generation.

ArentFox's automotive group primarily serviced traditional automotive clients including dealerships and logistics companies. The expert's role involved building a book of business, which proved challenging. However, they took numerous meetings with people willing to connect based on their background. They spoke with autonomous vehicle companies, autonomous trucking companies, remote tele-operating companies like Vay, and more traditional ADAS (Advanced Driver Assistance Systems) companies like Mobileye.

While many of these interactions were business development meetings where companies sought informal advice rather than paid work, this expanded the expert's view beyond their Pony experience. After approximately one year at ArentFox, the expert joined their current company, the U.S. subsidiary of a Chinese EV maker. In this role, there's overlap between true autonomous vehicle technology and ADAS/driver assist technology, though given that Chinese cars are effectively banned from import into the U.S., there isn't substantial autonomous vehicle-related activity in their current U.S. operations. The expert maintains contacts throughout the industry and stays engaged with the space, though they don't follow news developments super closely.

Industry Evolution Over the Last 12-24 Months

The expert identified several significant changes in the autonomous vehicle industry over the past 12-24 months. One particularly interesting development is growing confidence that technologies initially conceived as ADAS could actually achieve full autonomy. Tesla exemplifies this shift perfectly. When the expert first entered the industry, engineers insisted that full autonomy couldn't be achieved without designing systems from the ground up specifically for full autonomy. Many were skeptical of Tesla's approach of starting with ADAS and continuously improving and iterating toward full autonomy.

Initially, aside from Tesla, no one in the industry thought this was a viable solution. However, over the past 12-24 months, when speaking with people in the autonomous space, there's growing confidence that Tesla could actually succeed with this approach,

and that other companies pursuing similar strategies could as well. In China particularly, there's considerable discussion about their technology being amazing.

Additionally, some companies have made incredible progress during this period. Waymo stands out as particularly impressive—if you're in San Francisco, you see their vehicles everywhere. The expert has taken Waymo rides in San Francisco approximately one to two years ago, and the technology was incredible. The technology has likely improved even further since then. Waymo's quality is exceptional, and the expert has observed their expansion across the country. Recently, Waymo received what appears to be one of the first permits to test in New York, which is notable given the expert's knowledge of the state-by-state regulatory landscape. New York had previously banned any autonomous testing within the state. The expert has been very impressed with how much progress the industry has achieved in the last 12-24 months.

Use Case Growth and Market Segments

When asked about specific use cases or sub-verticals growing faster than the overall market, the expert noted that Waymo has been rapidly expanding its robo-taxi focus. Tesla allegedly has a robo-taxi operating in Texas currently, though the expert questioned how impressive it is, suggesting one reason Tesla focuses on Texas is the state's very light regulatory environment.

With other players, the expert doesn't see comparable commercial progress. Autonomous trucking companies like Aurora and Kodiak aren't moving at the same pace as Waymo, which is "just killing it." The expert heard that Waymo now generates more revenue than Lyft in San Francisco, which they found remarkable. For trucking companies, the expert still sees many demos rather than actual commercial deals. While these companies make press releases about pilot programs with FedEx, Target, and Walmart, the expert's outsider perspective suggests these appear to be pilot programs rather than real progress, though they acknowledged uncertainty about this assessment.

Various companies operate autonomous delivery robots, though the expert is skeptical about their success from an outside perspective. Tele-driving companies similarly make press releases, but the expert doubts they're generating substantial revenue.

Pony.ai's Competitive Position

The expert explained that the autonomous space fundamentally comes down to two factors: technology quality and operational capability. Part of why the expert left Pony relates to how the company navigated a challenging funding environment. There was a period when investors poured hundreds of millions into autonomous companies, but after

several years, many investors became frustrated with progress. Initially, everyone thought deployment would only take three to four years with cars everywhere. Reality proved far more complicated—when cars must drive themselves while navigating human drivers, and safety is the paramount concern, developing the technology becomes extremely difficult.

What separates companies like Pony and Waymo is technology quality and the ability to operate vehicle fleets. It's somewhat unclear to the expert from an outside perspective, but Pony has always maintained a competitive advantage and earned respect because allegedly it has substantial traction in China. They post videos of their runs in China and have obtained, over time from when the expert joined to the present, significant traction with commercial licenses in major metro areas including Beijing and Shanghai. They consistently announce achievements and tout their technology, and the expert confirms that Pony's technology is genuinely very good.

The expert has ridden in competitors' cars, and one particular U.S. competitor (name withheld) left a striking impression during a demo ride—the expert was blown away by how poor the technology was, thinking the company was three to four years behind Pony. The expert doesn't know exactly how good the technology is among Chinese competitors like Momenta and possibly DiDi, which focus on full L4 technology similar to Pony. While there are many press releases and milestone announcements, the situation isn't as clear as with Waymo.

The expert visited Shanghai in September of the previous year and also traveled to another Chinese city (possibly Hefei, though the expert admitted being poor with Chinese geography as an American-born Chinese person). These are locations where Pony has operations and conducts commercial operations. However, it's not like San Francisco with Waymo. The expert didn't see a single Pony vehicle during their visit. While Shanghai is more spread out and less dense than downtown San Francisco, the expert didn't observe autonomous cars driving everywhere in China as you see them in San Francisco. There are numerous PR announcements and achievements in China that the expert has no reason to doubt, but they haven't witnessed it firsthand and can't definitively speak to it.

Technology Approach and Differentiation

The expert is very familiar with autonomous vehicle technology to the extent possible as a non-engineer, having dealt with many legal matters requiring deep collaboration with autonomous engineers to understand the technology thoroughly. Pony's approach matches what Waymo and Aurora do—they use a sensor suite including LiDAR, cameras, and radar, combined with AI technology to train the car on driving behaviors.

Companies still operating in the space are all using essentially the same approach. The expert is less certain about Tesla's specific methodology, but the significant distinction with Tesla and some other car companies is their lack of LiDAR. This represents the ongoing debate among engineers: whether LiDAR is necessary or not.

Regarding Pony's Gen-7 autonomous driving system, the expert was unfamiliar with it since they left several years ago. The expert explained that tech companies, even those not particularly high-tech, label things similarly—Gen-6 represents one package of hardware and software, Gen-7 is the next package. While the expert doesn't know specifics of Gen-7, generally with autonomous technology and Pony specifically, how they define their generations isn't particularly material.

Expansion Challenges and Operational Bottlenecks

When discussing expansion to new markets, the expert noted that during their tenure, there was less large-scale expansion. Much of the expansion into new markets focused on expanding testing capabilities. This presents a huge challenge because you need on-site people to manage the fleet. Challenges arise when engineers are in California, Shanghai, or Beijing trying to iterate on technology hundreds of miles away. The expert saw news about Pony expanding into Europe, which is encouraging, but details matter significantly.

Many autonomous companies love making announcements about expanding into various markets, but this can mean anything from having two cars for PR purposes and photo opportunities with local governors, to deploying 10 cars with plans to roll out 100. The situation isn't clear, and expansion in autonomous vehicles is inherently difficult because larger fleets become more expensive to maintain, introduce more safety risks, and require more monitoring personnel.

The expert couldn't speak to Pony's current expansion status or their proficiency at it. During their tenure, expansion to a new market for testing was typically conservative. Companies wouldn't immediately roll out 50 cars in a new market. The process starts with a mapping vehicle to understand geography and build HD maps of the new area, then testing with a small fleet of perhaps two to five vehicles. Teams identify issues experienced in the new geography and iterate on the technology accordingly, developing understanding of specific city challenges and necessary navigation adaptations, then slowly expanding from there.

Regulatory Landscape and Impact

Regulatory differences represent a huge issue shaping operations for Pony relative to competitors and influencing where they chose to operate. The U.S. legal system is

extremely litigious and regulators can be extremely aggressive, whereas other countries are less litigious—a huge factor in operational decisions. People have asked the expert whether U.S. regulators are politically biased against Chinese AV companies, which the expert doesn't definitively know. However, there does appear to be more comfort operating in China and better ability to develop relationships with Chinese regulators.

In the U.S., as publicly known, Pony had a testing issue that drew intense scrutiny from NHTSA and the California DMV—this became the expert's primary focus. Having spent 60-70% of their time at the New York law firm doing government investigations, the expert brought relevant experience. This represented one of the first, if not the very first, autonomous vehicle technology issues that NHTSA actively investigated. NHTSA launched what they call a defect investigation, which the expert noted was somewhat silly because these were test vehicles rather than consumer vehicles, but these were the tools NHTSA had available.

This single investigation proved crippling to the company, consuming enormous resources, especially for a startup. Unlike Honda or Toyota with dedicated safety teams with 20-40 years of experience handling such matters routinely, Pony lacked this infrastructure. NHTSA was simultaneously trying to get educated on autonomous vehicle technology, acknowledging they didn't fully understand it. Shortly after Pony's issues, Cruise experienced major problems. The expert doesn't know the current status with NHTSA, but the agency has been very active investigating U.S. AV companies. Waymo deals with NHTSA constantly. This dynamic is simply very different in other countries where regulators don't necessarily work the same way. It's a huge, huge issue and one reason many companies avoid operating in the U.S.—the regulatory risk can be extraordinarily high.

State-by-State Regulatory Variations

A handful of red states maintain extremely laissez-faire approaches to autonomous vehicles. Some states have essentially joke-level regulation, either having no regulations on the books or just one-line regulations. Texas, Florida, and some Midwest states have very lax regulations. New York completely prohibits it—you're not even allowed to conduct any AV testing in New York. California is heavily regulated, requiring submission of extensive data reports and meeting numerous requirements before obtaining a commercial license.

California has a stepped licensing process: first a testing license, then a commercial license, then a driverless license. Companies must demonstrate through data that their technology is safe with a safety driver behind the wheel before graduating to a driverless license. The expert believes Texas and Arizona have none of these

requirements—companies are allowed to deploy without substantial regulatory requirements.

Regarding international regulations, the expert knows that China basically mimics the California scheme. Similar to the U.S. where different cities have different requirements within their territories, Chinese cities like Beijing and Shanghai have their own regulations, though not identical. The expert's recollection is they actually mirror California's regulations, essentially taking California's regulatory framework and imposing the same requirements in Beijing. There are some differences—the expert believes in Beijing, it's similar to going to the DMV and taking a driver's test. Companies must actually take their autonomous car and pass a driving test that a human can pass. The expert's understanding is that China is actually very similar to California in regulatory stringency.

Future Regulatory Outlook

When asked about regulatory approaches to AV pilots over the next 12-18 months, the expert really didn't know with certainty. In China, their sense is that Pony maintains a very good relationship with Chinese regulators who will continue supporting technology rollout. The expert has never heard of any major safety issues occurring in China, though the situation is somewhat unclear. The expert's sense is that China is very pro-AV and wants regulators to maintain that supportive stance.

In the U.S., the situation is less clear. The expert has been blown away by how much some companies have accomplished. They've heard about robo-taxis in Austin with Tesla and seen some videos showing poor performance—videos where cars are veering into oncoming traffic. The expert understands Tesla's approach uses a safety driver in the passenger seat rather than behind the wheel. In the U.S., if there's an accident, NHTSA will investigate very thoroughly.

The expert thinks the U.S. will generally face significantly more regulatory headwinds. From what they've observed, Waymo navigates these challenges exceptionally well, with really impressive people on their legal and safety teams. The expert's sense is Waymo has substantial trust with regulators, which is what everything boils down to in the U.S.: how much trust do you have with regulators?

The expert believes it's a difficult environment for startups to operate in because traditional regulators regulate heavily. As a startup, you lack resources to navigate that effectively. The expert thinks this is why Cruise exited—General Motors, which owns Cruise, evaluated the ROI, considering the money required for safety and legal personnel, developing relationships with NHTSA, against the minimal revenue from their robo-taxi

program. The expert thinks regulations will only increase in the U.S., especially as more vehicles enter roads and more safety accidents occur.

Growth Drivers and Industry Risks

For growth drivers supporting the industry over the next few years, the expert believes companies must prove their technologies are good enough for road deployment. This remains a huge question mark. The expert has very high confidence that Waymo's technology is already exceptionally good. Waymo will continue accumulating data showing ride volume, minimal accidents, and paying customer numbers. They'll sustain this momentum, enabling continued expansion. Other companies will need to demonstrate similar capabilities.

However, potential setbacks could occur if Tesla experiences a major accident killing someone with no one behind the wheel, or if Aurora's truck flips over on a major highway. Such incidents could set the industry back because U.S. regulation is so tied to politics. Currently in Texas, companies can do almost anything, but if people start dying, there will be calls for more regulation.

Success depends on companies demonstrating technology quality and accumulating real-life application data showing safety. The expert is very skeptical about many companies, believing many have technology that isn't good and isn't ready for prime time, with no realistic path to recover from that deficit. Technology is either good or it isn't. You either have good engineers with the vision and ability to execute, or you don't. The expert thinks numerous startups had good ideas and secured funding but won't be able to take the next step because their technology simply isn't good enough.

Market Consolidation Outlook

This is purely the expert's opinion, but they think many companies will fail. They don't anticipate substantial consolidation because dominant players don't need these companies. Waymo has no use acquiring other players in the space—they already have everything they need. It could be interesting to see what Tesla does; the expert could envision Tesla potentially acquiring certain companies for their technology. The expert had similar thoughts about Apple and was surprised Apple shut down their car project without attempting to acquire other players for their technology.

The expert's guess is there won't be much consolidation. Many companies will simply die because potential acquirers will look at them and say "We don't want to acquire this bag of risk." Many companies will see their funding dry up and won't be able to move enough paying customers to generate revenue required to sustain these technologies.

Cost Drivers and Scaling Economics

The expert isn't 100% certain, especially being somewhat outside the industry currently, but believes engineering talent represents the main cost driver. Companies need exceptionally talented engineers who constantly iterate on the technology and conduct test runs. Any issue discovered during a test run requires engineers to diagnose the problem and fix it. It's fundamentally a raw engineering talent requirement. AI might change this dynamic, potentially making the process significantly cheaper.

From what the expert has observed in the industry generally, it's about engineering talent, which might also explain why some smaller players aren't scaling. Beyond the Waymos, smaller companies may struggle because you need substantial numbers of highly talented engineers and extensive real-world test run data.

It's almost a compounding effect with Waymo—they have exceptional engineers and extensive real-world vehicle fleets, allowing them to expand and improve technology. Meanwhile, other companies with 10-20 cars in their fleet and perhaps 200 employees (maybe 150) simply can't achieve the same momentum. The expert acknowledged this is their opinion and they aren't entirely confident or certain about this assessment.

Pony.ai Leadership and Culture

As a final point, the expert added that Pony is generally viewed as having exceptional leadership and brains behind the operation. The CEO, James, is widely regarded as a very smart, capable manager and architect-type person. The CTO, Tiancheng, is generally viewed as a mathematical genius and the brains behind why their technology is so good. While the expert isn't an engineer and can't judge these technical matters definitively, they are impressive people. Having worked very closely with them for many years, the expert can attest to how impressive they are.

The expert doesn't know how other companies operate, but at Pony, they and a friend used to joke that the engineers function like a military organization. They are disciplined and execute effectively. The expert doesn't know the current state of affairs, but at the time, the engineering organization was very cutthroat with very high expectations. Again, as a non-engineer, the expert can't judge this comprehensively, but they maintained very aggressive release timelines, very high expectations of their engineers, and consistently excelled at execution.

The expert was there early and has equity in the company. There was a time when they thought the company had equal chances of going bankrupt or succeeding/going public. Over the years, it does seem they're on the right track. The expert is cautiously optimistic about Pony's future prospects.