Name: Sanjay Jagadeesh

**Research Journal**

A Research Journal is simply a way to document and organize your research. It is much less intensive than an Annotated Bibliography and will take less time to write up. In essence, a Research Journal captures the questions you’re asking in your mind while conducting research:

1. **What is this source about?** (a super-short summary)
2. **How does it relate to my thesis? How might I use it in my essay?** (among other things, the source might give background or define terms, it might support or contradict your thesis by offering examples or solutions, arguments or counterarguments)
3. **What are some key ideas/quotes that could be useful for my essay?** (having a list of quotes will help you when you start writing your essay)

For each source, you will briefly answer these three questions. Complete the template below, while looking at **8 sources** related to your research question.

**My Research Question**: In the future, how will the implementation of AVs change in the United States, and will it differ between different regions of the country?

**My tentative Thesis**: In the future, AVs will see limited growth across the nation, with most of the growth occurring in urban areas.

Source 1

# Title: Are Cities Prepared for Autonomous Vehicles?: Planning for Technological Change by U.S. Local Governments.

**Author(s)**: [Freemark, Yonah](javascript:__doLinkPostBack('','ss~~AR%20%22Freemark%2C%20Yonah%22%7C%7Csl~~rl','');), [Hudson, Anne](javascript:__doLinkPostBack('','ss~~AR%20%22Hudson%2C%20Anne%22%7C%7Csl~~rl','');), [Zhao, Jinhua](javascript:__doLinkPostBack('','ss~~AR%20%22Zhao%2C%20Jinhua%22%7C%7Csl~~rl','');)

**URL or link to the source**: [Are Cities Prepared for Autonomous Vehicles?: Planning for Technological Ch...: EBSCOhost](https://web-p-ebscohost-com.ezproxy.madisoncollege.edu/ehost/detail/detail?vid=3&sid=73fbf6dd-8157-4d65-9fd4-763ba3e6a792%40redis&bdata=JnNpdGU9ZWhvc3QtbGl2ZSZzY29wZT1zaXRl#AN=137014210&db=a9h)

**What this source is about:** (a super-short summary, typically 1-2 sentences)

The researchers conducted a study on the 25 largest cities and officials from 120 cities with populations larger than 100,000. They found that most cities have not started planning for AV implementation and that bigger cities were more likely to be prepared.

**How this source relates to my thesis and/or how I might use it in my essay:**

This source directly relates to my claim that Avs will see limited growth across the nation (not a lot of cities have started panning for Avs) and that big urban areas will see the most growth (more population = more likely to be prepared for AVs).

**Key quotes from the source:** (typically 2-4 quotes; be sure to include an MLA in-text citation after each quote)

“First, we find that few local governments have begun **planning** for AVs. Second, **cities** with larger populations and higher population growth are more likely to be **prepared**” (Freemark et al).

“Although local officials are optimistic about the technology and its potential to increase safety while reducing congestion, costs, and pollution, more than a third of respondents worried about AVs increasing **vehicle** miles traveled and sprawl while reducing transit ridership and local revenues (Freemark et al).

“Those concerns are associated with greater willingness to implement AV regulations, but there is variation among responses depending on political ideology, per capita government expenditures, and population density” (Freemark et al).

“Municipal governments' future approaches to AV preparation will likely depend on the characteristics of **city** residents and local resources. Planners can maximize policy advancement if they work with officials in other **cities** to develop best practices and articulate strategies that overlap with existing priorities, such as reducing pollution and single-occupancy commuting” (Freemark et al).

Source 2

Title: Self-Driving Cars

**Author(s)**: Stephen Ornes

**URL or link to the source**: [CQ Researcher - Self-Driving Cars](https://cqpress-sagepub-com.ezproxy.madisoncollege.edu/cqresearcher/report/self-driving-cars-cqresrre20190201#text-section-22-0)

**What this source is about:** (a super-short summary, typically 1-2 sentences)

Author Stephen Ornes goes over the background of self-driving cars (AVs), their current situation, as well as the outlook for the future. He highlights their pros and cons and why some industries/people may be support or be against AVs.

**How this source relates to my thesis and/or how I might use it in my essay:**

**I can use this source in my essay by connecting its points about the people who are against AV implementation/growth as examples for why the growth of AVs will be limited, while using the people who support the growth of AVs as a counter example.**

**Key quotes from the source:** (typically 2-4 quotes; be sure to include an MLA in-text citation after each quote)

“’Autonomous cars are going to largely eliminate jobs [people] weren't interested in and create opportunities in work that people will find more rewarding,” argued Ian Siegel, co-founder and CEO of ZipRecruiter, a job search website’” (Ornes).

“States and cities are bracing for the expected impact of driverless cars, which experts say could require a vast overhaul of transportation infrastructure. Radio transmitters might replace traffic lights, conduit for fiber optic cable might be added under roadways and digital devices might be installed along travel routes to communicate with the cars.” (Ornes).

“State highway planners say it will cost billions in public money to prepare the nation's 4 million miles of paved roads and 250,000 intersections for widespread use of autonomous cars.” (Ornes).

“The trade-off from such a massive investment in better roads could be fewer parking lots, garages and new-road construction, as autonomous vehicles make travel more efficient and operate as taxis and shuttles and make deliveries, according to some environmental researchers” (Ornes).

Source 3

**Title**: PREPARING FOR A DRIVERLESS FUTURE: AUTONOMOUS VEHICLES PROMISE TO REVOLUTIONIZE MOBILITY, BUT THEY’LL NEED THE RIGHT INFRASTRUCTURE TO DO IT

**Author(s)**: JIM PARSONS

**URL or link to the source**: [PREPARING FOR A DRIVERLESS FUTURE: AUTONOMOUS VEHICLES PROMISE TO REVOLUTIO...: EBSCOhost](https://web-p-ebscohost-com.ezproxy.madisoncollege.edu/ehost/pdfviewer/pdfviewer?vid=1&sid=25f1139b-105e-44db-ad8a-969a631d3ce1%40redis)

**What this source is about:** (a super-short summary, typically 1-2 sentences)

The author introduces AVs by discussing their rapid advancement before getting into the need for infrastructure. He emphasizes the need for infrastructure to “catch up” with the AVs, with different levels (from 0 to 5) of automation requiring different amounts of infrastructure.

**How this source relates to my thesis and/or how I might use it in my essay:**

**I can incorporate this source into my essay by using the different levels of vehicle automation (levels 1 to 5) to explain why it may be hard for level 5 (full automation) to become widespread in the United States.**

**Key quotes from the source:** (typically 2-4 quotes; be sure to include an MLA in-text citation after each quote)

“Firms looking to test AVs have pursued agreements with municipalities to put vehicles in live traffic, but that aggressive strategy may shift after a recent AV-related fatality” (Parsons).

“Opinions differ, for example, on whether AVs will follow the current century-long pattern of personal ownership or if the rising popularity of Uber, Lyft and other shared-mobility models will diminish that allure. A 2017 study by Arcadis, HR&A Advisors and Sam Schwartz Consulting forecasts that automated ridesharing and ride-sourcing services in the New York City, Los Angeles and Dallas-Fort Worth areas could shift nearly 7 million drivers into AVs over two decades” (Parsons).

“’If you can turn two 12-foot lanes into three 8-foot lanes,’ Iwasaki explains, ‘you’ve added more capacity with a minimal investment.’ However, concentrating more vehicles in narrower lanes could accelerate pavement deterioration. The Virginia Tech Transportation Institute hopes to get a head start on finding answers with its new study on pavement stress” (Parsons).

Source 4

Title: The Autonomous Vehicle Revolution: Implications for Planning/The Future Driverless City?/Autonomous Vehicles - A Planner’s Response/Autonomous Vehicles: Opportunities, Challenges and the Need for Government Action/Three Signs Autonomous Vehicles Will Not Lead to Less Car Ownership and Less Car Use in Car Dependent Cities - A Case Study of Sydney, Australia/Planning for Autonomous Vehicles? Questions of Purpose, Place and Pace/Ensuring Good Governance: The Role of Planners in the Development of Autonomous Vehicles/Putting Technology in its Place

**Author(s)**:  [Porter, Libby](javascript:__doLinkPostBack('','ss~~AR%20%22Porter%2C%20Libby%22%7C%7Csl~~rl','');)1  
[Stone, John](javascript:__doLinkPostBack('','ss~~AR%20%22Stone%2C%20John%22%7C%7Csl~~rl','');)2  
[Legacy, Crystal](javascript:__doLinkPostBack('','ss~~AR%20%22Legacy%2C%20Crystal%22%7C%7Csl~~rl','');)2  
[Curtis, Carey](javascript:__doLinkPostBack('','ss~~AR%20%22Curtis%2C%20Carey%22%7C%7Csl~~rl','');)3  
[Harris, James](javascript:__doLinkPostBack('','ss~~AR%20%22Harris%2C%20James%22%7C%7Csl~~rl','');)4  
[Fishman, Elliot](javascript:__doLinkPostBack('','ss~~AR%20%22Fishman%2C%20Elliot%22%7C%7Csl~~rl','');)5  
[Kent, Jennifer](javascript:__doLinkPostBack('','ss~~AR%20%22Kent%2C%20Jennifer%22%7C%7Csl~~rl','');)6  
[Marsden, Greg](javascript:__doLinkPostBack('','ss~~AR%20%22Marsden%2C%20Greg%22%7C%7Csl~~rl','');)7  
[Reardon, Louise](javascript:__doLinkPostBack('','ss~~AR%20%22Reardon%2C%20Louise%22%7C%7Csl~~rl','');)8  
[Stilgoe, Jack](javascript:__doLinkPostBack('','ss~~AR%20%22Stilgoe%2C%20Jack%22%7C%7Csl~~rl','');)9

**URL or link to the source**:

[The Autonomous Vehicle Revolution: Implications for Planning/The Future Dri...: EBSCOhost](https://web-p-ebscohost-com.ezproxy.madisoncollege.edu/ehost/detail/detail?vid=8&sid=40945c76-a91a-4146-a5d4-ab0e761572d5%40redis&bdata=JnNpdGU9ZWhvc3QtbGl2ZSZzY29wZT1zaXRl#AN=133508499&db=a9h)

**What this source is about:** (a super-short summary, typically 1-2 sentences)

The authors begin by outlining a scenario where AVs are predominate in everyday life. They then go on to argue that AVs will become more and more common in the future, though there are debates over whether they actually have a benefit.

**How this source relates to my thesis and/or how I might use it in my essay:**

I can use the debates over whether AVs are beneficial as an example for why AV growth may be slow and use the benefits of AVs and the statistical numbers of predicted AV growth as a counter example.

**Key quotes from the source:** (typically 2-4 quotes; be sure to include an MLA in-text citation after each quote)

“According to industry estimates, four in 10 **vehicles** will be **autonomous** by 2040 (Accenture Digital, 2014). This is a lucrative new industry, and while the estimates vary, the predicted global value of the **autonomous** **vehicle** industry has been projected at $US54billion in 2019, rising to $US556billion by 2026 (Garsten, 2018)” (Porter et al).

“Debate continues to rage about whether **autonomous** **vehicles** are safer than human-controlled **vehicles**, and whether or not this represents massive advantages for cities of the **future**, or a dystopia of more freeways, trips and congestion” (Porter et al).

“The AV **revolution** could be combined with a mass shift to carbon neutral **vehicles**, presenting new possibilities for carbon reductions. Many pundits claim AV is safer than human drivers, though recent high profile accidents have dented public confidence. For people with disabilities and impairments to mobility, AV presents transformative possibilities, with a recent survey in Australia demonstrating that more than 85% of people felt AV would bring mobility impaired people significant benefits (Regan et al., 2017)” (Porter et al).

Source 5

Title: The Future of Autonomous Vehicles in the Opinion of Automotive Market Users.

**Author(s)**:  [Stoma, Monika](javascript:__doLinkPostBack('','ss~~AR%20%22Stoma%2C%20Monika%22%7C%7Csl~~rl','');)1 (AUTHOR) monika.stoma@up.lublin.pl  
[Dudziak, Agnieszka](javascript:__doLinkPostBack('','ss~~AR%20%22Dudziak%2C%20Agnieszka%22%7C%7Csl~~rl','');)1 (AUTHOR) agnieszka.dudziak@up.lublin.pl  
[Caban, Jacek](javascript:__doLinkPostBack('','ss~~AR%20%22Caban%2C%20Jacek%22%7C%7Csl~~rl','');)2 (AUTHOR) j.caban@pollub.pl  
[Droździel, Paweł](javascript:__doLinkPostBack('','ss~~AR%20%22Dro%C5%BAdziel%2C%20Pawe%C5%82%22%7C%7Csl~~rl','');)2 (AUTHOR) p.drozdziel@pollub.pl

**URL or link to the source**: [The Future of Autonomous Vehicles in the Opinion of Automotive Market Users: EBSCOhost](https://web-p-ebscohost-com.ezproxy.madisoncollege.edu/ehost/detail/detail?vid=3&sid=0ab1bcf1-a0fe-4299-b000-705552fe8898%40redis&bdata=JnNpdGU9ZWhvc3QtbGl2ZSZzY29wZT1zaXRl#AN=152127097&db=a9h)

**What this source is about:** (a super-short summary, typically 1-2 sentences)

The researchers conducted a study on small, rural towns as well as cities with over 300,000 people in Poland. They found that, for multiple reasons, AV development/growth may not occur in Poland, with hybrid vehicles or electric vehicles likely to be more common.

**How this source relates to my thesis and/or how I might use it in my essay:**

I can connect the researchers’ findings in Poland to the United States and use the findings as evidence as to why the growth of AVs in the United States may be slow and/or concentrated in large urban areas.

**Key quotes from the source:** (typically 2-4 quotes; be sure to include an MLA in-text citation after each quote)

“Based on our own research, it can be concluded that, due to many different factors, including costs, legal regulations and conviction, among others, AVs will not appear so soon in common use on Polish roads” (Stoma et al).

“The results of the research showed that the majority of respondents consider hybrid **vehicles** (HVs) and then electric **vehicles** (EVs) to be the dominant type of **vehicles** in the near **future** in Poland, at the same time pointing at the long process of adopting AV technology” (Stoma et al).

Source 6

Title: Forecasting Americans’ long-term adoption of connected and autonomous vehicle technologies

**Author(s)**: Prateek Bansal (Graduate Research Assistant),

Kara M. Kockelman (E.P. Schoch Professor in Engineering)

**URL or link to the source**: [Forecasting Americans’ long-term adoption of connected and autonomous vehicle technologies - ScienceDirect](https://www.sciencedirect.com/science/article/abs/pii/S0965856415300628)

**What this source is about:** (a super-short summary, typically 1-2 sentences)

The study conducted by the researchers aims to forecast America’s long-term adaptation of AV technology under different circumstances (ex: drop in price, increase in willingness to pay, etc). The researchers find that various circumstances lead to different levels of AV technology adaptation.

**How this source relates to my thesis and/or how I might use it in my essay:**

**I can use the researchers’ findings to both agree (evidence) and disagree (counter evidence) with my thesis that Av development in the United States will be slow and/or limited to large urban areas.**

**Key quotes from the source:** (typically 2-4 quotes; be sure to include an MLA in-text citation after each quote)

“Long-term fleet evolution suggests that the privately held light-duty-vehicle fleet will have 24.8% Level 4 AV penetration by 2045 if one assumes an annual 5% price drop and constant WTP values (from 2015 forward). This share jumps to 87.2% if one uses a 10% annual rate of decline in prices and a 10% annual rise in WTP [willingness to pay] values” (Bansal and Kockelman).

“Overall, simulations suggest that, without a rise in most people’s WTP, or policies that promote or require technologies, or unusually rapid reductions in technology costs, it is unlikely that the U.S. light-duty vehicle fleet’s technology mix will be anywhere near homogeneous by the year 2045” (Bansal and Kockelman).

Source 7

Title: Autonomous Vehicles in the United States:Understanding Why and How Cities and Regions Are Responding

**Author(s)**:

Daniel G. Chatman, PhD, AssociateProfessor, Department of City and Regional Planning, University of California, Berkeley

Marcel E. Moran, PhD Student, Department of City and Regional Planning, University of California, Berkeley

**URL or link to the source**: [Autonomous Vehicles in the United States: Understanding Why and How Cities and Regions Are Responding](https://escholarship.org/uc/item/29n5w2jk)

**What this source is about:** (a super-short summary, typically 1-2 sentences)

The authors analyze how different cities, transit agencies, and metropolitan areas are responding to AVs. They found that activities regarding AVs differ wildly between areas, with different cities taking different approaches/steps towards AV adoption.

**How this source relates to my thesis and/or how I might use it in my essay:**

**I can use the evidence of cities trying to adapt AVs as a counter example to my thesis while also bringing up the point that the differences in AV planning may actually limit the overall growth of AVs in the United States.**

**Key quotes from the source:** (typically 2-4 quotes; be sure to include an MLA in-text citation after each quote)

“We found a broad spectrum of activity on the part of the public sector regarding AVs, as well as a taxonomy of motivations, which ranged from attempting to harness these vehicles to help boost transit ridership, to speeding the adoption of road pricing, increasing density, stimulating technology-sector economic development, generating revenue, and improving pedestrian safety” (Chatman and Moran).

“Agency responses to AV testing vary dramatically –from complex permitting processes and RFPs to intentional delay in developing policy so as not to deter AV activity” (Chatman and Moran).

“Autonomous vehicles (AVs) hold the promise of improving road safety, making travel less stressful, lowering shipping costs, and reducing the need for automobile parking. They also raise concerns about worsening congestion, declining transit ridership, competition for curb space, and even increased urban sprawl. Testing of AVs is being carried out in at least 36 states in the U.S. along with a growing number of AV pilot services (Etherington, 2019)” (Chatman and Moran).

Source 8

Title: An exploratory analysis on city characteristics likely to affect autonomous vehicle legislation enactment across the United States

**Author(s)**: Hella Alnajjar a, Kaan Ozbay b, Lamia Iftekhar c

**URL or link to the source**: [An exploratory analysis on city characteristics likely to affect autonomous vehicle legislation enactment across the United States - ScienceDirect](https://www.sciencedirect.com/science/article/abs/pii/S0967070X23002159)

**What this source is about:** (a super-short summary, typically 1-2 sentences)

The researchers conduct a study in which they examine urban city characteristics that may change their AV regulations. They find that certain characteristics found in some urban areas lead to an increased likelihood of AV adoption.

**How this source relates to my thesis and/or how I might use it in my essay:**

I can use this source to provide evidence to my thesis that urban areas may see the majority of AV growth/implementation and connect it back to the characteristics that the researchers found.

**Key quotes from the source:** (typically 2-4 quotes; be sure to include an MLA in-text citation after each quote)

“The findings reveal that an increase in electric vehicle use, GDP per capita, freeway VMT, and land use score of a UZA increase likelihood of AV testing adoption, while an increase in fatality cases negatively impact the likelihood of adoption (Ceteris paribus)” (Alnajjar et al).

“AV adoption is dependent on legal aspects such as infrastructure requirements, liability/insurance, and data privacy and security. Legislation to establish a legal framework authorizing AV operations was often the first step towards widespread AV testing in states such as Kentucky (Farrah, 2023), Michigan (Davis, 2022), and Arizona (Randazzo, 2018). Enacting state legislation on AV testing is also considered a general indicator of the beginnings of AV adoption by the National Highway Traffic Safety Administration (NHTSA)” (Alnajjar et al).