

PAVING THE WAY TO ZERO EMISSIONS

OUR TRIP TO CHAMPAIGN-URBANA

EXPLORING HYDROGEN FUEL CELL TECHNOLOGY
FOR A SUSTAINABLE FUTURE



TRIP OBJECTIVE

The primary objective of the trip to Champaign-Urbana was to visit the Mass Transit District (MTD) to observe their groundbreaking hydrogen fuel cell technology up close.

The aim was to showcase the benefits of this technology to our elected officials as Charlottesville looks to become emissions-free by 2050.



TRIP PARTICIPANTS

Charlottesville Area Transit

Dir. of Transit- Garland Williams
Asst. Director- Barry Herring
Asst. Director- Michael Newbill
Mktg. Coord.- Alex Pasqualone

City of Charlottesville

Mayor- Wade Juandiego
Councilor- Michael Payne
Councilor- Lloyd Snook
Clerk of Council- Kyna Thomas
Trans. Planning Mgr- Ben Chambers
Dir. of Sustainability- Kristen Riddervold

Albemarle County

Dep. County Exec- Ann Wall
Vice Chair, BOS- Diantha McKeel

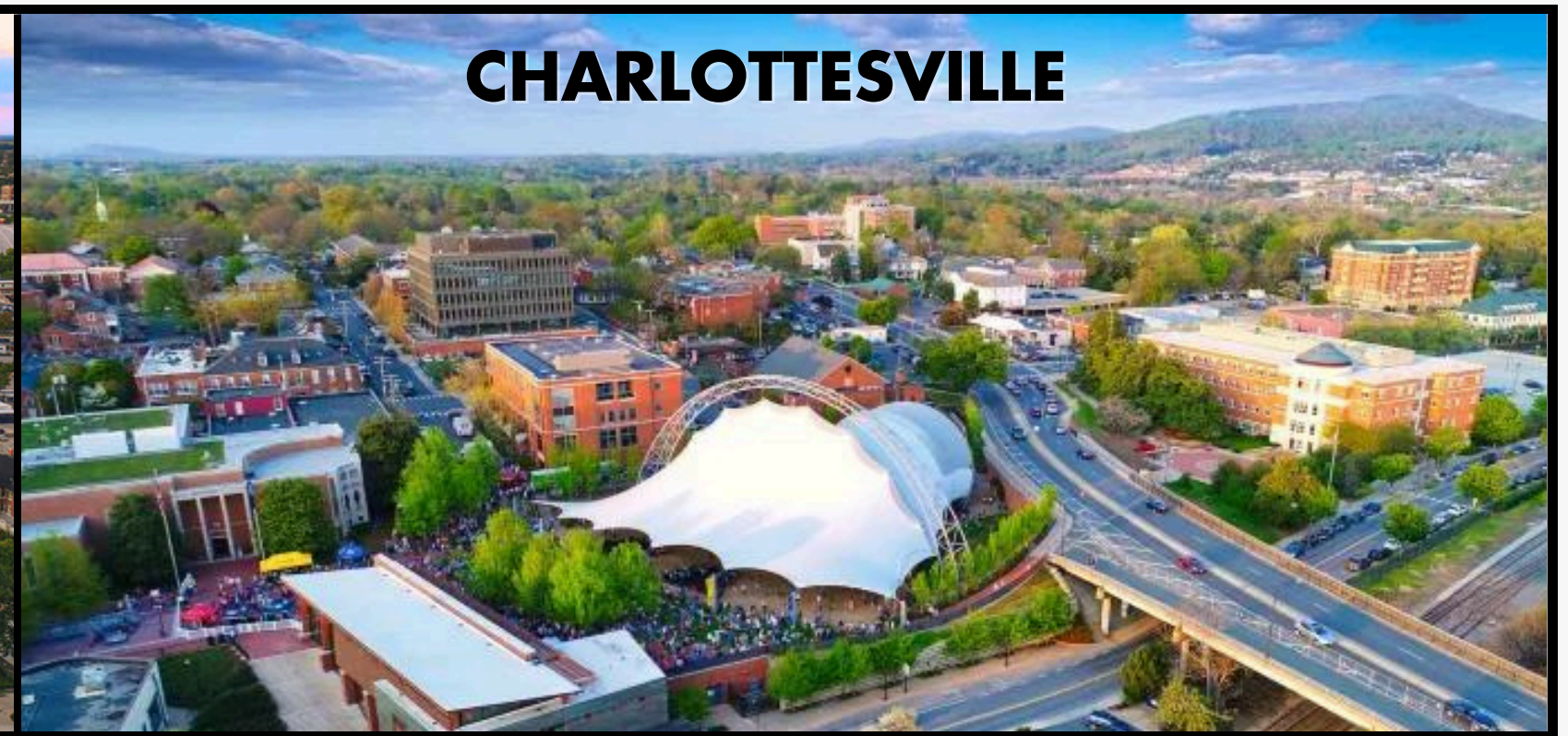
Consultant Team- Kimley-Horn



CITY COMPARISON:



- University town with a dynamic community
- Similar transit challenges as Charlottesville
- Innovative transit solutions in place



- University town with a vibrant community
- Facing a demand for sustainable transit
- Looking to adopt cutting-edge technology

RELEVANCE:

- Comparing similar cities provides practical insights
- Learning from MTD's experience aids our transit enhancement efforts
- Helps in making informed decisions for CAT's future

SERVICES PROVIDED:



- Fixed route service + Late night fixed routes
- Paratransit service
- SafeRides Service for students
- C-Carts Van Service
- University Routes
- University Football Game Routes
- Unit 4 and District 116 Middle and High School service + school trips/events

- Fixed route service + Downtown trolley
- Paratransit service
- MicroCAT rideshare service
- Charlottesville City Schools service + school trips/events

Key Differences:

- MTD services the local university, CAT does not
- MTD operates 7 days a week including late night, CAT operates 6 days a week until 10:30pm

SERVICE COMPARISON:



Serves Champaign, Urbana, and Savoy. Also serves Middle & High Schools, and the University of Illinois.

- **Year Founded:** 1970
- **Service Population:** 135,400
- **Total # of Buses:** 114
- **Number of Routes:** 26 Transit Routes
- **Yearly Riders:** 9,548,293 (FY '24)
- **Number of Employees:** 377
- **Percentage of buses hybrid:** 85%
- **Cost:** Free for Students, \$1 per trip for gen public



Serves Charlottesville & parts of Albemarle County. Also serves Charlottesville City Schools.

- **Year Founded:** 1975
- **Service Population:** 87,755
- **Total # of Buses:** 48
- **Number of Routes:** 12 Transit Routes
- **Yearly Riders:** 1,353,060 (FY '24)
- **Number of Employees:** 135
- **Percentage of buses hybrid:** 15%
- **Cost:** Fare-free

MTD RIDERSHIP BREAKDOWN:

- **Total Ridership FY '24:** 9,548,293
- **University Total:** 7,709,243
 - U of I students: 7,415,016
 - Staff/ Faculty: 259,572
 - SafeRides: 34,655
- **K-12 Students:** 362,265
- **ADA**
 - Paratransit: 133,535
- **General Population Total:** 1,343,250
 - Annual Pass: 504,673
 - Adult Riders: 228,429
 - DASH/Senior Riders: 387,492
 - All Day Passes: 3,055
 - Transfers: 77,445
 - Monthly Pass: 107,926
 - Veterans Pass: 32,992



LUNCHEON WITH MTD LEADERSHIP

Discussion Points:

- **Transition to Hydrogen Fuel Cell Buses:**

- Factors considered: environmental impact, cost, infrastructure, and community benefits.
- Decision-making process: Evaluating different fuel technologies and selecting hydrogen for its long-term sustainability.

- **Benefits of Technology:**

- Improved air quality, reduced greenhouse gas emissions, and long-term cost savings.
- Enhances public perception and support for innovative transit solutions.

- **Funding and Partnerships:**

- Collaboration with federal programs to support the transition and discussed funding sources and financial feasibility for hydrogen fuel technology.

- **Challenges and Solutions:**

- Addressed common concerns such as fuel production, storage, and safety with practical solutions implemented by MTD to overcome these challenges.

“This project fits into the city’s climate goals which are 45 percent reduction by 2030 and carbon neutrality by 2050.” – Kristel Riddervold



TOUR OF MTD FACILITIES

EXPLORING STATE-OF-THE-ART HYDROGEN TECHNOLOGY

During our tour of MTD's facilities, we observed their state-of-the-art transit station, on-site hydrogen production area, advanced fueling station, and the bus storage building which houses their offices and Headquarters.

The hydrogen production area, powered by solar arrays, generates 420 kilograms of hydrogen daily. The fueling station efficiently fuels buses in about ten minutes, minimizing downtime. The bus storage/operations building is designed for optimal space utilization and operational efficiency.

“Hydrogen is above you, and it is 17 times lighter than air so if there’s a leak it goes at 45 miles per hour straight up away from the passengers, away from the driver.” –Karl Gnadt

Transit Station



Hydrogen Production



Fueling Station



Bus Storage/ HQ



POST-TOUR SITDOWN WITH MTD

Discussion Points:

- **Hydrogen Start-Up Costs:**

- Initial investment required for hydrogen infrastructure and bus integration.

- **Fleet Composition:**

- Current fleet of hydrogen buses and plans for future expansion.

- **Station Expansion:**

- Comparing hydrogen delivery versus on-site production for future needs.

- **Production Station Layouts:**

- Current and future layouts for hydrogen production stations.

- **Advantages of Hydrogen:**

- Benefits of hydrogen fuel cell buses over traditional battery-electric buses, including efficiency and operational reliability.

“Battery-electric vehicles are not a one-for-one replacement for a diesel bus. Hydrogen fuel cells offer greater range and operational consistency.”

– Karl Gnadt



ACTIONABLE STRATEGIES & NEXT STEPS FOR CAT

APPLYING LESSONS LEARNED FROM MTD

Actionable Strategies:

- **Adopt Hydrogen Fuel Cell Buses:**
 - Develop a phased plan for fleet integration.
- **Infrastructure Development:**
 - Invest in necessary infrastructure, including fueling stations and maintenance facilities.
- **Training Programs:**
 - Implement comprehensive training programs on hydrogen technology and safety.

Timeline to Zero Emissions

- **2028:** No more buying fossil-fuel buses
- **2050:** Completed Transition to Zero Emissions

Next Steps for Charlottesville:

- **Implementation Plan:**
 - Steps required to implement hydrogen fuel cell technology.
- **Phased Approach:**
 - **Short-term actions:** Pilot programs, initial investments, stakeholder engagement.
 - **Long-term actions:** Full-scale adoption, continuous improvement, community outreach.



MORE INFO AND INSIGHTS GAINED

Learn More:

- **Trip write-up with interviews & podcast**
 - Sean Tubbs, Town Crier Productions
 - <https://tinyurl.com/mrm4z4p5>
- **Our Webpage for Zero Emissions**
 - <https://www.charlottesville.gov/1789/Ride-Green-Campaign>
- **MTD Webpage for Zero Emissions:**
 - <https://mtd.org/inside/projects/zero-emission-technology/>

Impact of Trip:

- **Strategic Planning:** Influences CAT's transition to hydrogen fuel cell buses.
- **Operational Improvements:** Help CAT optimize transit services with MTD's best practices.
- **Community and Environmental Benefits:** Enhances contributions to Charlottesville's environmental goals.



CONCLUSION & ACKNOWLEDGMENTS

Conclusions:

- **Trip Highlights:** Visual and practical insights gained into hydrogen technology.
- **Impact on CAT:** Significant influence on CAT's plans and zero-emissions goals.

Acknowledgments:

- **Thank you**
 - To Champaign-Urbana Mass Transit District for their hospitality and expertise.
 - For the participation and support of all team members and elected officials.



THANK YOU!

STAY TUNED FOR OUR SECOND VISIT
LATER THIS SUMMER

