

Physical Development Committee – Minutes 2/21/20

Participants: Stacey Baumgarn, Jean Christman, Ed Peyronnin, Monica Latham, Mark Paschke, Terry Schlicting, Shelly Carroll, Kristi Buffington, Mike Ellis, Jim Sites, Tonie Miyamoto, Edit Szalai, Doug Max, Steve Burns, Dustin Vinzant, Jim Jensen, Pam Jackson, Julia Innes, Dave Bradford, Aaron Fodge, Tim Kemp, Carol Dollard, Lucas Miller, Fred Haberecht

1. Solar

- A. There is solar on campus now.
- B. Criteria & Exclusions – see PowerPoint presentation
- C. Do we own the solar installations?
 - I. The large installation on Foothills is a power purchase agreement.
 - II. There are 6 different financing scenarios with the solar we have. We own some, not others.
- D. Solar on roofs of parking garages can protect from shade, hail, etc.
- E. Parking canopies are one of the most expensive ways to mount solar because of the cantilevers.
- F. Possibility for us to plant pollinator friendly plants under the solar.
- G. Possibility for us to try grazing sheep and solar on ARDEC.
- H. Need to have caution mixing cattle and solar because of the strength of cows to push solar over.
- I. Opportunities for solar
 - I. Have to get a partner on board before we can finalize a list of locations.
 - a. Bike shelters not shown on map, but those types of locations could be considered.
 - II. Solar on ARDEC could be an opportunity to show brand – everyone drives by the green roofs on I-25 and could recognize as CSU.
- J. How many megawatts are in our system? There are 6.8 megawatts now.
 - I. The system on Foothills is 5.3 megawatts and 1.6 megawatts in smaller systems on main campus.
 - a. Could easily do 3, 4, or 5 megawatts with the available roofs now.
 - II. Solar-powered use - percentages
 - a. Foothills campus is 30% solar powered today.
 - b. Deploying 3-4 systems at ARDEC, could get ARDEC to 100% solar powered.
 - c. For CSU main campus, it would be 10-20%.
 - III. Has battery storage become part of the discussion?
 - a. There is a benefit in peak reductions for balancing solar and loads. Will ask about what they can do with batteries, and it will be part of the RFP.
 - b. For agriculture use – reliability of power is a concern, so would need to incorporate batteries for resiliency.
 - i. Resiliency discussion is coming into climate action planning.
 - c. Parking lots – charging electric cars is in line with solar on parking lots.
 - i. However, can't currently go directly from solar to a car, has to go through a panel and go back out.
 - IV. CSU received Platinum designation for STARS – how does this help that designation moving forward?
 - a. There is a renewable power point for STARS designation that this could contribute to.
 - b. Can recruit students with sustainability mindset.
- K. Specific deployment will be approved by the PDC.

- I. Discussion regarding having stronger language for the motion to build solar ready locations for the future: *Encourage, Support, or Enable* instead of the word *Allow*.
 - a. PDC prefers language of “support”
- II. Motion made by Mike Ellis - ***Update the CSU Development Standards to support solar installations in parking lots, bike shelters, on buildings, and ground mounted with prior approval of the specific location by the Physical Development Committee.***
- III. Seconded by Mark Paschke.
- IV. Approved by committee, all in favor.

2. Starship Robots

- A. Food delivered to students and employees from restaurants on campus by the Starship Robots.
- B. Starship Robots are semi-autonomous delivery robots.
 - I. There are facilities where humans can control the robots, not autonomous 100% time.
- C. CSU would not be buying the robots.
 - I. Starship maintains all technology to run them, maintaining menus and apps, and supplying all ordering equipment.
 - II. Would have to find them a room with a lot of electrical and WIFI to upload info and charge robots.
- D. CSU will define where they travel (for example, on paths or at intersections). Can determine days of the week and times for avoiding areas as well.
 - I. The robots can climb up one curb height, but can't go up steps.
 - II. Pick up location has to be outside the door, not inside.
- E. Robot specifics
 - I. They have proximity sensors – can detect motion and determine what the motion is.
 - II. Lid unlocks for restaurant employee and for customer only.
 - III. Runs on cellular, then WIFI as backup.
 - IV. Has a speaker on it with prerecorded voice responses.
 - V. Lighted flag and lights around robot for safety of people to see where it is.
 - VI. Has 10 cameras around it with an almost 360-degree view.
 - VII. Insulated
- F. Other universities and organizations are participating in this program – see list of places on PowerPoint presentation.
 - I. George Mason University piloted this program.
 - II. Purdue has the largest fleet on their campus (30-35 or less).
 - III. Robots on these campuses are crossing city streets with complicated landscape.
- G. Housing and Dining Services (HDS) wants to pilot this program with a focus on the west side of campus/HDS areas in particular (such as the boundaries of Braiden, Ram's Horn, Academic Village, Durrell, Corbett-Parmelee, Allison) with HDS restaurants supporting the delivery for residential students.
- H. Future possibilities include:
 - I. Meridian Village
 - II. A ghost kitchen – there wouldn't be a front of house; it would just support delivery service, especially with a focus on late night services.

- III. Other options for delivery relevant to campus operations – for example, could the robots deliver mail on off-peak times in the future instead of having vehicles on the roads?
- IV. Could solve problems that we don't realize it could.
- I. Value to Campus
 - I. Robotics brings efficiency. Restaurants are labor intense and the biggest expensive.
 - a. Late night food options 8 p.m.-1 a.m. are difficult to do (efficiently and fiscally responsibly). This could help with meeting student demands for late evening service, helping to efficiently run operations.
 - b. Food delivery is growing exponentially in the restaurant world.
 - c. Adds convenience to students and employees.
 - II. Examples in PowerPoint presentation (slide 9)
 - a. CafeX - a robotic barista (above)
 - b. Sally the Salad Robot (below)
- J. Student Engagement
 - a. Can watch videos of students showing empathy for robots.
 - b. Students dressing up as Starship Robots for Halloween.
- K. Why not hire student on bike?
 - a. This is costlier and more complicated than a third party that has the technology to manage all the details.
 - b. Would need app, merchant payment connections, ordering hardware system, lots of resources that HDS doesn't have and shouldn't be focusing on.
 - c. Safety reasons – don't want students out that late.
- L. Discussion/Questions
 - I. Ed P. asks about where they are parked /staged during the day.
 - a. Student employees responsible for putting them in and out.
 - b. Can stage them in queuing areas that we determine based on traffic and safety.
 - II. Ed P. asks, Who determines the routes? How do we plan to gather information and understand lessons learned from other universities that are already implementing this?
 - a. 100% determined by what the university wants.
 - i. HDS has not gotten into discussions about who specifically will weigh in on that for CSU. Need to first make sure this is wanted.
 - ii. At Purdue, the Police Dept. spends a lot of time deciding this.
 - iii. Other campuses rely more on Facilities Management making the decisions.
 - b. Starship representative is on call at all times for any issues of service turned on or off or adjusting where the robot is going.
 - III. Jim S. acknowledges that crossing streets is complicated - Can we set up robots with minimal street crossing?
 - a. The robots cross busy city streets in D.C. vehicles at CSU go much slower on our streets. However, our issue is all the different types of users (bikes, pedestrians, etc.) on the trails.
 - b. Fred states that the Transportation & Mobility Safety Taskforce is working on how to take intersections and make them more predictable and have compliance.

- i. Lucas M. has talked with both the Public Safety Team and Transportation & Mobility Safety Taskforce representatives about this in relation to our complex environment.
- IV. Fred H. - What does Starship Robots consider as success?
 - a. They must be running the company at a loss. They quickly realized the \$250,000 revenue minimum was a major hurdle when they first started, and would be hoping to do about 20 robots (or less if just on west side of campus). They don't have a dollar minimum or robot minimum. They want access and exposure right now.
- V. Fred H. - Deployment could be complicated as there is quite a bit of construction, so routes would change.
 - a. Starship Robots gave examples at George Mason of navigating something similar to our LSC plaza and construction navigation.
 - b. Another question is, Do we want these out on game days? Probably not. Could just shut them off.
- VI. Dustin V. asks how much they weigh.
 - a. Maybe 40 lbs., but it can carry 25 lbs.
- VII. Dustin V. wonders if it is possible to interact with one in person before making a decision.
 - a. Lucas M. can ask Starship Robots to come to campus, so can interact with it in person.
- VIII. Jean C. asks if there are any locations that failed or pulled out after implementing?
 - a. So far there aren't; robots have been on campuses for 2 years or less.
 - b. Could do a one-year agreement like we did with the E-scooters.
- IX. Aaron F. – There are many companies that want to leverage university infrastructure to make revenue. Who will pay for the infrastructure improvements?
 - a. For example, regarding access for rideshare, some universities are starting to charge for access. Or for private shuttles. As we contract with companies, we need to be cognizant of infrastructure impacts.
- X. Mike E. provides feedback on the student center perspective, and has significant questions and concerns to address in another meeting with Lucas when there is more time.
 - a. As business partners that struggle interior to campus to make ends meet, the LSC will need more time to discuss this and realize the impact on the LSC.
 - i. Retailers have a difficult time being successful, even with 24,000 people per day at the Lory Student Center.
- XI. Lucas M. can envision how it makes sense financially and operationally for HDS, but understands that there are challenges for LSC.
 - a. Suggests having HDS try it out. It's about adding incremental sales (adding revenue); the impact isn't as much in staffing and operationally as it may seem.
 - b. HDS is open late hours to try to meet student needs.
- XII. Shelly C. – would service only be offered during evening hours? Or only to residence halls and not across to the Oval?
 - a. May map out a little further east than Braiden to have some pick-up locations available for employees who may want to use RAMwich in Braiden, which tends to be very busy at lunch time.
 - b. Mostly just wanting to start by focusing on the west side of campus.

- XIII. Tonie M. shares that her assistant director is from George Mason. It can help with the last mile of transportation. She said it takes some getting used to, and it's the future; students are utilizing it. Best to understand what we can learn from it to help determine the future. If not this, then drones will do it – or if not drones, then something else.
- XIV. Pam J. – In a pilot how many robots would there be? Would it include Subway delivery too or would other vendors be able to participate? What are other schools doing around that? Have there been barriers to student adoption? Or staff adoption? At other schools are employees participating?
 - a. Starship Robots advises 20-25 robots to start, but it depends on restaurants and size of campus.
 - b. Many of the campuses have outside food vendors using this. Vendors are responsible for setting it up directly with Starship.
 - c. They have set up with outside companies such as
 - i. Subway
 - ii. Panda
 - iii. Garbanzo
 - d. Benefit to the university is they will be using university currency, so CSU would be earning a percentage of the sale of the transaction fee.
 - e. Are there issues in management from other universities who have adopted this regarding barriers to student adoption and messaging?
 - i. Northern Arizona and Purdue have had their presidents in videos as part of messaging.
 - ii. Barriers are not from students, but some difficulties include navigating busy city streets.
 - iii. At Purdue, there was an issue crossing busy street. Its default is to stop when it can't figure something out. This was in the student newspaper in regards to negative messaging.
 - iv. Messaging around employment is that Starship hires students to clean and charge robots, as well as some software development. This would not reduce the amount of students HDS hires for their restaurants.
- XV. Jim J. has concerns about orders getting pushed back further or further to prioritize deliveries. Thinks it is important to take care of customer in front you. There could be a backlash because of the business model of dropping everything for deliveries. What about students at dining hall waiting in line?
 - a. Private businesses are seeing the revenue in delivery.
 - b. This may be viewed differently based on generations.
- M. From a safety perspective, the Police Department, Public Safety Team, and PDC need to be involved to make recommendations.
 - I. Transportation & Mobility Safety Taskforce will need to make formal recommendations about safety to the Public Safety Team regarding bikes, peds, vehicles, etc.
 - II. There are unanswered questions about the economic model and the impact to other businesses on campus that need to be better understood before the PDC can make a recommendation.

- III. Mike E. is intrigued by the concept, but more discussion will need to occur, including with retail vendors to understand how it impacts them.
 - a. Mike E is in support of it occurring for the residence hall at nights.
 - b. Understand business models of other campuses first.
- IV. To make a decision, PDC would need:
 - a. Mark P.– Want to understand more of the logistics, such as routes, schedule, number of vehicles estimated, times of day, where they would not initially be deployed.
 - b. Dave B. – HDS to develop where they would like the robots to be based on where kitchens and deliveries are (west side of campus). Then develop a subset of potential locations if they were to go to other areas.
 - c. Jim J. – Set a timeline of when to start.
 - i. July/August to work out operational logistics, then would like to start fall 2020 semester. It could also be spring or fall 2021.
 - ii. Prefer to start at beginning of school year, but need time before starting to learn the system.
 - d. Doug M. recommends using data from institutions currently using Starship.
 - e. E-Scooters is a model for this, but a set of criteria is needed.
- V. Fred H. proposes that the PDC could give ultimate approval because of wide-base of stakeholders – sustainability, aesthetics, business, and safety
 - a. Gather input from:
 - i. Public Safety team for safety concerns
 - ii. Business owners to understand financial implications (Mike E. and stakeholder group)
 - iii. Involve Risk Management to understand liability - Who is liable if there is an incident?
 - iv. Procurement
- VI. Fred H. asks, Does this support sustainability efforts on campus?
 - a. For delivery need to consider food in compostable containers.
 - b. Imagining how the vision for this could be larger than food, how it can do other things in relation to trucks that currently idle. Could have huge impacts in the last mile of other deliveries.
- VII. Tim K. asks about the speed of the robots.
 - a. Speed is up to 4 miles an hour.

3. **Safety Taskforce** – ran out of time, postponed

4. **Campus Arboretum** – ran out of time, postponed