

Master Plan Committee (MPC) 10/23/2023

Present Committee Members:

Dave Bradford, Cody Frye, Mari Strombom, Steve Cottingham, Santiago Di Pietro, Emily Seems, Virginia Fanning

Absent Committee Members:

Tom Biedscheid, Jan Nerger, Brendan Hanlon, Tom Satterly, Christa Johnson, Blanche Hughes, ASCSU president

Ex-Officio:

Gargi Duttgupta, Mike Rush, Julia Innes, David Hansen, Lauren Gleason, Paul Doherty, Grant Calhoun, Jen Marley

Agenda Item 1 (Transportation Demand Master Plan Update):

- Transportation Demand Management Plan process has concluded. Last time completed was ten years ago.
 - Not ready to adopt at this point. Need to close the contract with Kimley Horn. Administration needs to formally adopt but the CSU master plan has not happened yet.
- Final Draft with comments (MPC and Public) incorporated into Final Draft. Final Draft will be sent out to MPC with the meeting minutes. Memo by consultant to be included.
 - 2 placeholders (Complete Streets Guide & Construction Detour Guide)
- Public announcement about the completion of the final draft – October 30th
 - Will include updates to TDMP website; Source & Collegian articles; emails to stakeholders

Agenda Item 2 (Center for Advanced Lasers and Extreme Photonics) – Grant Calhoun

- Center for Advanced Lasers and Extreme Photonics was brought to the Board of Governors and approved. Get input from committee on anything regarding land, development, technical details – project is still pending plan of finance.
- Vision: “... will be the most powerful laser facility of its type, enabling world-leading research into fusion energy, medicine, and materials characterization.”
- Initial work done in last 18 months and a preliminary design:
 - First floor: Laser bay, target area, and labs for laser activity
 - Second floor: Classrooms and offices and non-technical spaces
- Existing Proposal – The preliminary design was modified based on negotiations with Marvel Fusion, a Germany-based fusion start-up company that has existed for four years. They have venture capital money. They have a theory of fusion that is laser driven, using the high powered laser to start a fusion reaction.
 - “Build a 43,000 gsf two-story laser center on the Foothills Campus, housing three powerful, advanced laser systems developed and maintained by researchers from CSU and Marvel Fusion, a Munich-based fusion energy company.”
- Grant Calhoun shares picture of Jorge and team (photo in PowerPoint) – shows the existing target chamber (one of two laser systems in Advanced Beam Lab – ABL).

- What is a laser? Take a beam of light, concentrate it down until it is smaller and smaller to change the frequency and shape of the beam, taking a single beam of energy and modifying its shape and power, concentrating it.
- World class researchers at CSU – there is a history of funding and lots of success with the team. The graduates are in extreme demand.
- Laser Fusion is different than nuclear fission.
 - A nuclear bomb tears apart the nucleus, releases an incredible amount of energy, but there are all the harmful byproducts and radioactive waste that last.
 - Fusion is the opposite – Hitting a target with an intense beam, making the nuclei fuse together. The weight of the combined nuclei is less than the two original. Energy created in the reaction. A carbon-free energy system, if can prove it works, scale it, and make it efficient.
- December 2022 – The first ever net positive energy from fusion reaction (National Ignition Facility at LLNL, Berkeley CA) using lasers. Results replicated in 2023.
 - CSU’s current laser can fire 1 shot per second.
 - The planned CSU/Marvel Fusion lasers for the new facility will be 10 shots per second.
 - The National Ignition Facility laser is 10 shots per week.
- Additional advanced laser applications – CSU does fusion-related science but not necessarily energy-related. There are lots of different applications, such as lithography, medical, and defense.
- Laser fusion in U.S.
 - There are 10-15 laser facilities of similar power as CSU.
 - LaserNet U.S. – a Dept of Energy program that CSU participates in. Ensures there are high-powered research facilities available to U.S. researchers in the country. Hard to build and expensive to maintain.
 - Green pie slice on PowerPoint indicates users that come to CSU. It is the most sought-after facility in the program.
- Support & Growth for Laser Fusion – lots of funding and venture capital going into this.
- Purpose of project
 - More powerful lasers now needed; ABL is too small, outgrowing it
 - DOE provide funding to build a 4-PW laser if new facility is built (\$25 M)
 - Marvel Fusion will build two powerful lasers if a new facility is built (\$50 M)
 - Other university researchers will use the new lasers through LaserNet US (DOE will provide \$5M/yr)
 - Other companies will pay to use the new lasers; multiple industries
 - The laser fusion field is at a critical stage of infrastructure development
- Benefits to CSU
 - Would immediately be a world-leading laser center
 - Student involvement and continued engagement from private sector (be involved or adjacent to this type of facility)
- Project Plan developed by Hord Coplan Macht last year. Design is now too expensive for the value.
 - Original design included: 43,000 gsf 2-story building; First floor: Thick concrete slab to minimize vibration, Infrastructure for one laser (the beam from one can be split); Second floor: Preparation laboratories, Offices, Teaching spaces.

- Current design includes: Three ultra-high-power lasers will be able to be fired in synchrony to briefly produce a peak power of 14 Peta-Watts (about 14,000X the power produced by all power plants in the US).
- Site Options
 - North side of Foothills Campus
 - Site 1 directly south of ABL (not a lot of space to expand to south)
 - Breezeway attaching ABL and facility (original)
 - Site 2 – east of ABL, southside of the road (preferred)
 - No direct connection to existing facility (preferred)
- Redesign occurring, so first floor & second floor plan design not fully accurate, showing specs that came with original design
- Project schedule
 - Preliminary design developed mid-2022; estimated cost \$63-\$68 M
 - Facility to include CSU-developed, DOE-funded laser only
 - Project did not move forward
 - Early 2023: Negotiations with Marvel Fusion (MF)
 - MF to build two lasers and place in Center; CSU to own lasers
 - First three years MF to provide 50% of laser time to other users, smaller percentage after
 - MF to lease office and laboratory space for 20 people
 - MF to provide \$1M in student support and other programmatic efforts
 - June 2023: CSU and Marvel Fusion signed confidential Term Sheet
 - Facility to be designed in conjunction with Marvel Fusion & informed by other laser centers
 - Construction completion estimated 42 months after project approvals
 - CSU signed MOU with Tetrad to explore development/design of project. It was a cabinet level decision that the project could not move forward unless there was a private solution to finance it because of the strain of other project bonding capacity.
 - Aug 2023
 - Updated board and made public announcement of CSU-Marvel Fusion project.
 - Sept 2023
 - Tetrad issued RFP for architect services for the initial program plan development because too expensive as currently designed. CSU needs functional lab/laser space. Tetrad's business model is to take the additional space and make it profitable for them.
 - October 2023: Selection of SWBR, a Rochester, NY-based firm
 - SWBR did the University of Rochester Laser Lab – most powerful in country.
 - TBD: Plan of Finance Approval by Board of Governors (planning for December meeting)
 - TBD: Development Agreement between CSU and Tetrad
 - Design process for initial program plan would go to end of Jan. 2024 – can then understand pricing better, and how much CSU or Tetrad will take.
 - TBD: Research and Facility Partnership Agreement between CSU and Marvel Fusion
- MPC Discussion
 - Steve Cottingham asks about the current thinking for the site location.
 - David Hansen – the current plan is to place it east of the access road.
 - Dave Bradford – what is the driving decision between the two proposed locations?

- Grant Calhoun – Add capacity for what can be done in the space. To the south there is nowhere to expand if wanting to have an adjacent building. To the east, it is a big open site. There is room to keep moving east and possibly south if they wanted to have a larger vision.
- Gargi Duttgupta – who will own the building, the facility?
 - Grant Calhoun – There is a ground lease of the space. Tetrad will build. Tetrad has never owned a CSU building. Doesn't know if it's a capital lease or a partial lease; still being decided.
- Gargi Duttgupta – If it is a ground lease, because there is grant funding, is there a term (5 year? 10 year?) for the grant funding? If dependent on that, then what happens to the facility?
 - Grant Calhoun – There is an unwillingness to make a baseline commitment for annual lease amount. \$4–6 M a year to finance the bldg. How much is CSU willing to commit? VPR committed \$2M a year for the first five years. The VPR, Operations, and 80% of the College of Engineering in direct cost return has pledged to it. College would keep enough to expand the administration services needed to provide services for that building and everything that already exists in ABL. VPR and Operations have agreed to release that indirect cost recovery toward the annual payments. Trying to make a risk-based decision.
- Dave Bradford – how many people would work within the building (additional people coming to Foothills Campus to work there)?
 - Grant Calhoun – A team comes in through LaserNet and has approx. 7-10 people several weeks at a time. They don't have office space in that area. Don't know what ancillary space will be built. If building more office space, then that could bring in more. Baseline number: three more hires in College of Engineering. Not much of an academic volume impact. May have more offerings or research experience. Classroom portion would be relatively small.
- Dave Bradford likes the east side option the best because they just spent \$2M on parking lot two years ago.
- Gargi Duttgupta – A design team was selected. When developing a program plan, exploring how to build a program that will be financially and space-wise efficient, where does the involvement or technical side of CSU teams come into play—code, utilities, best interests and standards?
 - Tetrad selected the architect. CSU is not driving that. There are weekly standing meetings between Tetrad and Marvel about what will go inside, developing the needed specs of the building, not the design of the building. They have engaged with utilities employees in Operations.
 - Gargi Duttgupta – Foothills Campus has challenges around connectivity. It impacts the whole campus and the strategies for the other campuses, which is where the Master Plan committee's perspective comes in because they are looking at the whole master plan.
 - Grant Calhoun – acknowledges that they skipped a step, regarding come to the Master Plan Committee.
 - David Hansen – Another reason to bring this to Master Plan Committee, assuming it goes forward, is that there is a county approval process that needs to be navigated. Master Plan Committee has to be involved/engaged in the conversation for that.
- David Hansen – Is there any reconfiguration of the existing ABL with equipment or other factors?
 - Grant Calhoun – It has the HVAC needs for this type of facility. There was discussion around could part of it be decommissioned to accommodate other space needs. Existing laser will

continue to do the current research. Would be more expensive to design an existing laser into the new facility than to keep it where it is. It is not a very dynamic space except for what it is already used for.

- Steve Cottingham – how detailed is the plan for Foothills Campus? Is the considered site just identified as space for general research or are there long-term thoughts for that space?
 - Gargi – There are not really concrete plans on what specifically would go to a location, though there were some visions. With the new VPR, there may be other ideas that come up. Have discussed where there may be synergies, but not a distinctive plan with so many leadership changes.
 - David Hansen – Through the visioning conversation and the connector road, which is further east of site discussed today, there was discussion on if there could there be a community hub like the functions of LSC with joint uses for the whole campus, but nothing specific identified for that space.
 - Gargi Duttgupta – a lot of people see the 1700-acre campus and see vacant space, but there is a lot going on. The foothills visioning video most people have seen. There is a report as well, but it doesn't give specific details.
- Grant Calhoun – When Hord Coplan Macht did the original design, would that decision have come through MPC?
 - Mike Rush – There is a lot of direction from central administration to move projects along. If you don't know if it will be a reality, then it may not make sense to promote it to the MPC. FM pulled the program plan together that went to the board for approval. The HCM plans happened in the last 12–18 months and did not come to MPC. Design Review Committee did discuss that they felt it was an appropriate site for this use and would have recommended to MPC.
- Steve Cottingham – Is it important at this point for the new facility to be proximate to the existing facility? Is east of the road the best spot for it, since they are no longer physically connected as in the original site suggestion?
 - Gargi Duttgupta – Assumes Tetrad would engage with design team at this point.
 - Grant Calhoun – from a technical and programmatic point of view, discussed at length how to connect them and how to get the beam out of the ABL into the new facility to recombine it. Faculty would probably be housed in ERC. There are still reasons to keep it close.
- Dave Bradford – Foothills Campus has been a concern of PFA in past because the north and south ends only have one way in and out for emergency response. With increased activity with lasers, are levels of danger increasing enough that PFA might have a concern that there is no back up road? If there was an accident on the front end of the road and they couldn't get across, what increased risk might there be or need because of what is technically in the building?
 - Grant Calhoun – It wouldn't be different than the rest of ABL. The magnitude of risk may be bigger, probably the same problem but possibly worse. In the existing design there is not a hazardous waste that is different. If another company came, then there may a hazardous material that could change the nature of it.
- Gargi Duttgupta asks Grant to convey to the team: Because there is a higher intensity, the power needs may be something of concern and that may raise the hazard levels. We have the existing utility information. It would be good for the Planning Design Construction team with this technical expertise to be involved to consider any issues or where those concerns may be. If there is an increased need for parking, that will come into play also.

- Grant Calhoun – These new lasers are more efficient. Yes, they are engaging with FM operations / utilities.
- Grant asks when would be a good time to come back to MPC?
 - Recommendation is to come back once the program design is done, prior to taking updated program plan to the board.
- Gargi Duttgupta – Why have we not explored fusion in the past?
 - Grant Calhoun – The science didn't allow it until recently when made some advances. The steps that you need to take to create the reaction, needs to be efficient enough to scale it.
- David Hansen – Need to make sure we are thoughtful about the timing of the county submittal and have done the due diligence when putting it together.

Agenda Item 3 (Mountain Campus Update) – Lauren Gleason & Jen Marley

- Vision, Mission, Values – see PowerPoint.
- Programming from 2023 – for context see PowerPoint.
 - Warner College is main user.
 - A lot of researchers come to Mountain Campus for day trips.
- Mountain Campus Presidential Taskforce
 - Charged in May 2023. Met weekly. Presented recommendations recently and now working on follow up items.
- Approx. 75 structures on Mountain Campus
 - Housing & Dining Services (HDS) operates and maintains the facilities at Mountain Campus onsite in partnership with Facilities Management which does some scope of work.
- Developed 2017 master plan. Since then, two new capital buildings managed by Capital Construction were built: Waste Water Treatment Plant and Harbison Research & Education Building.
- Studies with 3rd party consultants
 - 2019 & 2020 Facility Condition Assessment: One study focused on all the buildings. The other was a smaller study that focused on the faculty cabins.
 - 2022 Building Code Assessment: provided data including several code deficiencies and health/life safety issues.
- Known Facilities Needs – Pulled data from the studies and by operating/being present on site to identify projects – things that need to be addressed at mountain campus. Have sorted them into general categories, but the list is fluid and flexible.
 - Capital Planning Projects – Need to include the planning and infrastructure type of work that can cause difficulties when trying to advance a project.
 - Master Plan
 - Electrical Study
 - Campus Utilities (Water, Sewer)
 - Telecommunications (Internet, WiFi, Satellite, Phones)
 - Parking, Roads, Bridges & Trails
 - Security; Signage
 - Building Repair & Maintenance – smaller projects
 - Roofs, siding, windows, doors, lighting, decks & stairs, hot water heaters, etc.
 - Capital Projects – not comprehensive list below, just examples.
 - Student Cabins (priority – wood burning stove replacement with alternative heat source)

- Faculty Cabin and Far Side Cabin Replacements
 - Demolished Faculty Cabins 1, 2, 3, & 5.
 - Faculty cabin 4 burned last fall. Concerns with condition of bldg. and extraordinary cost to repair, decided to demolish.
 - Main Vehicular Bridge
 - Dining Hall and Kitchen
- Health/Life Safety and Building Code Deficiencies
 - Fire systems, code-required signage, structural, MEP, accessibility
- Challenges – When they try to start something, they get hung up or stuck. The remote location is a challenge in getting project work done and industry interest. Balancing the rustic nature and charm of the mountain campus while needing to bring facilities up to a current condition.
- Next steps:
 - Comprehensive planning – holistic
 - 24 student cabins – how to bring them up to code once they begin work.
 - Major shortage of sleeping space now that five faculty cabins are lost.
 - Failed procurement – Project out to bid twice, failed both times.
 - Possibly dollars not big enough (~\$300-350K for example, over a year ago) – repackage to over \$1M to have more appeal, but then get stuck on infrastructure needs and what the future plan is.
- Gargi Duttgupta – Once the taskforce report is finalized and approved that will come back to the Master Plan Committee and will provide direction.
- Discussion:
 - Mike Rush – Is there any inclination that the university will dedicate resources to the Mountain Campus?
 - Dave Hansen – That is one of the driving forces behind the taskforce. A recommendation was made but there are some additional asks from Amy Parsons and Rick Miranda regarding documentation to take it to the next level.
 - Gargi Duttgupta – The intent is to build on the strategic thinking that Dean Hayes and others had done in the past. The taskforce will look at how it ties to the mission. Agreed that without resources, this is not possible. The report is meant to be the first step in where they believe they want to go.
 - Steve Cottingham – Is part of the financial model related to more research or more visitors?
 - Lauren Gleason – Could not find a year when Mountain Campus made money.
 - Discussed the idea to declare that it is an asset and resource, even though it will probably not make money. It is run as an auxiliary.
 - Steve Cottingham – There was substantial concern during the wildfires that Mountain Campus would be severely impacted by that. Is wildfire mitigation and land control any part of strategies if going to make investments in the space?
 - Lauren Gleason – They are working with the state and the college for mitigation.
 - Paul Doherty – Colorado State Forest Service is housed within Warner College so there is a natural tie to forest management.
 - David Hansen – The 2017 plan was brought to master plan committee and described aspirational goals, assuming the carrying capacity of campus was 500 people and that the waste water facility would be able to handle that capacity. The next step is that the kitchen

cannot handle it. There is a cascading effect. Then the cabins can't handle more people without a redo.

- Gargi Duttgupta – It is similar in acreage to Foothills Campus, but the access is as a seasonal facility.
- Lauren Gleason – Discussed pushing out the shoulder seasons. The further the season is pushed out the longer that the facilities team needs to be there to winterize the facilities.
- Grant Calhoun – Have you looked for federal funding?
 - Lauren Gleason – Yes, newly in progress.
- Mike Rush – The cabins are in such a state of disrepair that from a code perspective and life safety perspective it makes sense to deconstruct those. Could those sites be secured for temporary housing that is outside of the building codes and is safer, such as using RVs for the season, then bringing them down the canyon at the end of the season? If there are not significant resources, may want to think about housing on a more temporary basis.
 - Gargi Duttgupta – The challenge is when temporary becomes permanent. It will destroy the sense of place for the Mountain Campus. Once a commitment is made, need to complete the commitment.
 - David Hansen – Got approval from the county to construct new cabins, then the fire and COVID happened. Trying to secure enough financial resources has been a challenge – did get the entitlement to do it.