

# Cupertino High School

CEFPI MacConnell Award Submission

# Executive Summary

Located within the technology hub of Silicon Valley, the Fremont Union High School District (FUHSD) sought a Student Union for Cupertino High School (CHS) that redefined traditional high school design models and more closely resembled both a collegiate environment and the collaborative and creative office culture of the surrounding technology campuses.

Incorporating key themes that are emerging as defining elements of today's educational model, the District and design team focused on **collaboration, technology, engagement, and sustainability—concepts that are influencing how school facilities are designed and built today**. The District recognized that as the ways in which we teach our children evolve, so must the spaces in which we teach them.

CHS's Student Union project sought to fulfill a number of significant needs. It would serve as the formal entrance to the school and house the Administration and Counseling Offices, Cafeteria, and Library under one roof, as well as redefine the school's social and learning environments. Both aesthetically and functionally, it would be dramatically different from the school's low-slung ranch style look that no longer relates to the changing landscape of the surrounding technology campuses, fostering a greater connection between the CHS campus



and the community, and ultimately enhancing its image among families who live and work there.

The project completed on time and the new Student Union opened in January 2014. Situated at the front of the campus, the 29,000 square-foot, two story facility offers a formal entry to the school, while being composed of informal learning spaces that support the school's vision of 21st century education. The administration offices were relocated to this facility to offer a clear point of contact with the community while also improving access control and security.

The building design provides a series of connected spaces, which include a variety of environments for students to work collaboratively, study quietly, eat, conduct research and socialize throughout the day. It features an open staircase to the upper

level, which houses café-style seating tables and presentation areas. Also on the second level, the Library provides traditional reading and studying areas, as well as enclosed flexible meeting spaces with folding glass walls.

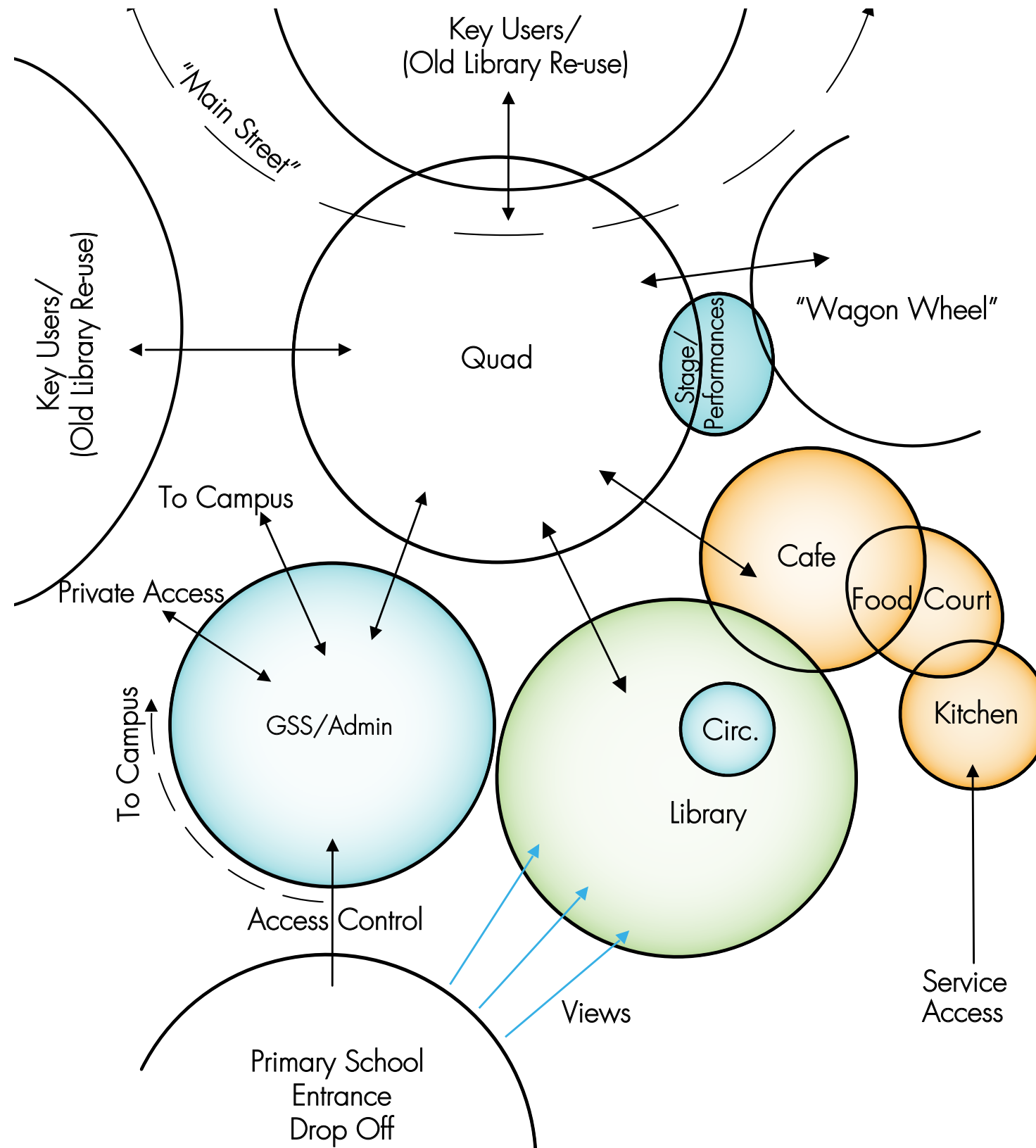
As part of the project, a completely renovated main Quad was designed adjacent to the Student Union, which offers a performance stage and seating areas that seamlessly blend this outdoor space with the Student Union's multi-use spaces. The Library and Quad are also connected to a second-level outdoor terrace which provides additional seating with views of the Quad and performance stage. Celebrated by all on campus, the Student Union serves as a cornerstone facility—it is a hub for activity and better reflects the culture and capabilities of CHS students. It is reminiscent of both collegiate and technology office environments.

# Scope of Work

The design of the Cupertino High School Student Union was a unique opportunity to provide an innovative facility for a growing, successful high school and to redefine the school's identity and connection to the community. The scope was to **create a new Student Union that combined three elements of a school into one building;** the Administration & Guidance Student Services; the school Library and the Food Service and Café area.

The design process for the project was an integrative collaborative process to ensure the design maximized the opportunity to deliver an excellent educational environment at a great value to the District. Highly integrated design processes were used in which all members of the team worked closely together to meet the challenges of the project.

Building Information Modeling (BIM) was employed to further expand the capabilities and collaboration among the team. From the early stages of schematic design BIM was used to develop design ideas and models that clearly communicated the vision to the Design Committee. Meetings involved live walkthroughs of the three dimensional model that allowed the committee members and the Board of Education to better understand the design of the project, demonstrating virtually how the spaces within the building would look and feel upon completion.



# Budget

In all public projects the budget is always a significant concern. From the onset the project team worked closely together to manage a tight budget. The District's initial Bond Planning process which concluded in the Program Improvement Plan (PIP) set an initial budget of \$15.8 million. This represented a tight budget for the complex program and high construction costs in the Silicon Valley area.

The budget is an active part of the design process at every stage of the project. Budget implications of every design decision were carefully considered with the impact on the educational program and the environment. At each phase of the design a thorough cost estimate was conducted to provide an important benchmark to ensure the project was on track. As a result any cost cutting measures of this estimating was discussed with the Design Committee and consensus decisions made.

As the project moved closer to state approval it became clear that regional construction costs were climbing much faster than expected. A combination of the recovering economy in Silicon Valley and significant local construction projects was driving up both labor and materials costs. To manage the budget the project team worked collaboratively through a value engineering process. A number of possible changes were identified and their impacts on budget and design were articulated and presented to the Design Committee for their recommendation. The final project budget was \$16.6 million. By actively managing the budget and working collaboratively, the design team and the Design Committee were able to address these challenges and deliver a building that met all of the school, District, and community's goals for the project.



## Community Engagement Process

# Community Engagement Process

The design and construction of the Cupertino High School Student Union was the result of a significant process of community engagement that shaped the design and built support in the community.



## DESIGN COMMITTEE

District Superintendent  
School Principal  
Vice Principals  
Facility Manager  
Teachers  
Large groups of students

The Design Committee met on a regular basis for over two years to successfully guide the development and success of the project.

## Community Engagement

During the Architectural selection process, the District assembled a committee representing community members to select the firm. This process featured an on-site design exercise centered on the creation of a flexible learning space able to accommodate groups of various sizes in the Library portion of the Student Union.

A Design Committee was then formed to represent the Cupertino High School community. Developed in close collaboration with the Design Committee and student group the development of the Educational Program for the project established:

- Educational goals
- Organizational opportunities
- Technical building requirements

The process of developing the Program enabled the design team to gain a deep understanding of the culture of Cupertino High School including the educational programs, history, personality and connection to the community.

The Program illustrated the significant need for additional, flexible spaces to accommodate a variety of group and individual learning and collaboration activities outside of the classroom including flexible classroom areas and meeting rooms within the Library, accommodation of a variety of group activities in the Dining area of the Cafeteria, and gathering spaces within the Quad and other outdoor areas.

Engaging the community throughout the project culminated in a public celebration of the Student Union. Presentations of the design to the Board of Education featuring renderings and interactive walkthroughs generated excitement and as the project began construction there was a formal groundbreaking ceremony attended by the Board and the community at large. To mark a significant turning point in construction a "topping out" ceremony

where current and former students, teachers, administrators and Design Committee members signed the final beam and watched it be raised into place.

The project concluded in a formal Grand Opening that featured student theatrical and musical performances, speeches, a ribbon cutting and tour. Local media covered the events and kept the community well informed and engaged throughout the project. Together these events and media coverage helped tell the story of the project to the community and built continued support for Cupertino High School and further facilities improvements throughout the District.



Educational Environment

## Educational Environment



The campus was always buzzing with activity, but there were very few spaces available that were well suited to these activities.

### Focus on Education

Through community engagement and the programming process it became clear there were critical facilities needs at Cupertino High School that the Student Union could address. As the design team spoke to students and teachers and spent time on campus the continued need for spaces for students to work and study as obvious. Students were crammed into the small library at all times of the day, using any available outdoor space, sitting under the covered walkways and working in the cafeteria. They were working in small and large groups as well as individually, studying together, doing research, attending club meetings and many more activities. Much like the surrounding business environment in Silicon Valley there was a lot of informal, collaborative and highly productive activity happening. Cupertino High School needed a variety of spaces that could support all of these diverse learning activities and be flexible enough to adapt to changes in student needs throughout a day, a semester and over time. Addressing this important need for collaborative, flexible working environments was a driving force behind the design of the Student Union.

The goal throughout the design was to create a spectrum of different learning and collaboration environments that would support a range of activities and a variety of learning styles. The first space on that spectrum is in the design of the Café space. The nominal function of the Café space is for daily lunch and brunch meals. However, from the very beginning of the process the design team encouraged thinking about what else this space could be. To create a greater variety of spaces and greater flexibility the design team proposed splitting the Café between two levels to create a more dynamic space that could serve as an eating and





To accommodate the significant growth in student enrollment, the new Student Union freed up other spaces on campus for conversion to classrooms. The existing Library and Administration buildings are being converted to classrooms over the next two years to meet the need for additional classrooms.

#### Focus on benefits for education

- Spirit of collaboration and innovation
- Sense of entry and identity for the school
- Dynamic collaborative environments for a variety of learning activities
- Healthy food services
- Counseling and Career Services

gathering space but also create a variety of learning environments. The lower level of the Café has large traditional cafeteria tables and is connected to the Food Court. Featuring large glass vertical sliding doors, it connects seamlessly to the Quad making it a great space for eating and an excellent venue for large meetings and presentations, group meetings or projects. To support these activities the space has a large built-in video projection system as well ample power and internet access.

The second level portion of the Café serves as an additional, less formal, dining area with café tables and comfortable seating that overlooks the first floor portion of the Café. This expands the available seating for dining and for large events. It also provides a **flexible dynamic space that feels more like the coffee shops across the area that are hubs for students and entrepreneurs than a high school cafeteria.** This furniture can support student groups of any size or be used by individual students. The space has ample internet access and an interactive display system to support students as the work, study, and learn. The Café is a light filled space with views and a direct connection to the Quad. These Café spaces have become a hub of activity and collaboration at Cupertino High School, much as common areas and dining facilities are important hubs at surrounding high-tech campuses.

Directly adjacent to the upper level Café space connected with a curving glass wall, is the new Library. The Library was designed to provide different types of collaborative spaces. One of the needs heard from students was the importance of having a place like a traditional library where they could work alone in a quiet atmosphere to focus on individual work. The Library provides a variety of spaces on the quieter end of the spectrum.



Upon entering the Library from the upper level of the Café there are a variety of small spaces with soft seating created around the book shelves to provide comfortable informal study areas. The stacks are also connected to a series of conference rooms of different sizes and a small computer lab. These spaces are available for reservation and use by students. They are used for a wide variety of activities from small study groups, to club meetings and presentations. The small rooms are acoustically isolated from each other and the Library, but all have windows into the Library for supervision.

Adjacent to the stacks and the Circulation Desk is the reading area, nicknamed "The Bridge" because it is in the portion of the building that bridges over the new campus entry. This is a large light filled space with a



variety of seating options for students making it a great area for quiet studying and research and offers a great view of both the school entry and the Quad.

Adjacent to “The Bridge” are two flexible classroom spaces that work together to create a variety of dynamic learning spaces within the Library. The first is the larger of the two spaces and is outfitted as a computer lab. The second is slightly smaller and contains movable furniture so it can be configured in diverse of ways. These two spaces are separated from each other with a solid operable partition, allowing them to be quickly combined to create learning and presentation spaces that can support nearly 100 people.



Both spaces are separated from The Bridge by an operable glass wall. This allows one or both of these spaces to be opened up to this common area to create a large presentation and meeting space that can accommodate up to 200. Alternately, the larger classroom can be separated to create an acoustically isolated space for a teacher to work with a class on a research assignment while the smaller space is opened up to serve as additional reading and studying space. The combination of operable partitions allow for a wide variety of configurations to support educational programs, create a variety of learning environments and support students with different learning styles.

## Outdoor Learning

In designing the Quad, Terrace and other outside areas the design team strove to create spaces that provided **dynamic learning environments which transitioned seamlessly with the interior spaces**. The Quad sits at the center of campus and supports a wide variety of uses. On the east side of the Quad a raised concrete stage surrounded by radial seating and paving creates an amphitheater space serving as an excellent venue for a variety of events such as dances, performances, club presentations, etc. Around the edges of this space are concrete seat-walls surrounding planting areas configured in curved and spiral shapes to create opportunities for comfortable individual and group work.

The Quad space connects seamlessly into the Café via large vertical sliding glass doors. On nice days those doors can be opened and the dining and learning opportunities can flow into the Quad. Connected to the Library and overlooking the Quad is the second floor Terrace. Much like the upper level of the café this roof deck complete with plantings and café tables provides additional informal seating to extend the audience area for large events and additional learning environments. The plantings and café tables create an informal feel and a more secluded outdoor environment than the Quad.

Together these spaces create a wide variety of additional learning, collaboration and work spaces to the students of CHS. **This variety of spaces allows students to select the study environment that works best for their activity and learning style.** It also provides the same type of dynamic and collaborative environments that are one of the hallmarks of the high tech campuses in the area where many of these students may go to pursue their careers.





# Physical Environment

# Physical Environment

One of the main goals was to create an inspiring new entry to the campus that reflected the spirit and the academic achievement of the students of Cupertino High School. The school was built in the early 1960's at a time when what is now Silicon Valley was a suburban bedroom community. The surrounding area was largely tract housing with associated shopping centers and civic institutions. Cupertino High School reflected this environment and was designed as a low profile "ranch style" series of buildings. Over the past twenty years Cupertino has transformed into the heart of Silicon Valley and many of the houses have been replaced with apartment buildings and high tech office parks. At the same time **Cupertino High School has grown into one of the highest performing high schools in California and the relationship between it and the community has changed.**

All of these factors led to the need to create a strong new entry building to the campus with the new Student Union project. The goal was for the building's appearance and configuration to reflect the modern and dynamic nature of both the school and the community to create a stronger connection between the two.

## Sense of Entry

The new Student Union is a dramatic change to the appearance of Cupertino High School. The former Cafeteria building which formerly occupied the same space was nondescript and did not provide a sense of entry for the school. It prominently featured the service areas for the Kitchen and created small entry pathways on either side of the building between it and the Gym to the south and Auditorium to the north. The new Student Union replaces this building with a dramatic new structure that creates

a single, monumental point of entry between the Administration and Café portions of the building. The space between the point of entry becomes a pedestrian street that connects the Administration and Café spaces and leads to the new Quad which forms the heart of the school.



Along this street are additional access points into the Café and Administration areas and a stair leading to the second level Terrace. Bridging over the entry is the dramatic curved roofed volume of "The Bridge" space in the Library. The glazed form of this space allows views into the library from the community and serves as a symbol of the academic excellence that is a strong part of the identity of Cupertino High School to the community. **Together these features create a dynamic building that evokes a college campus and creates a new image of Cupertino High School in the community.**

## Safety & Supervision

The existing Administration area was located within the campus and did not provide enough space, the required sense of entry, or adequate security at the entry to the school. In the Student Union,





“The pride and excitement that I could see with students when this building opened was exactly what they needed to feel to know that they are special and will be successful.”

Polly Bove | Superintendent  
Fremont Union High School District

the Administration area is located with a formal entry lobby at the front of the school facing the new drop-off area. It is designed to provide a welcoming sense of entry and supervision of the main entry point into campus. The new Administration area provides new offices, meeting spaces, and counseling offices. It consolidates these functions, previously spread around campus, into one central location. The design also allows easy student access to the Administration area from the new Quad. Together these features help to improve the connection to the community by creating a more welcoming and inviting environment for visitors and better supervision of the school entry.

The Quad is a very important part of the identity of Cupertino High School. The existing Quad serves as a hub and gathering space for the campus. It is a venue for various performances and events and is used for the variety of informal gathering, socializing and studying activities that form the heart of a high school student's experience. Unfortunately, the existing quad space was very drab and not well equipped to support these activities. It was also an insular space with little connection to the larger community. The design team sought to design a dynamic space that could support a variety of activities throughout the school day and year. The layout of the Quad and the design of the seating and gathering spaces support a variety of learning, socializing and collaboration activities. The entry street connects the activity of the Quad directly to the main entry to the campus and to the community, inviting them into the heart of the school.

The Student Union reflects the identity of Cupertino High School through its high performance features. From the programming process moving through design high performance design strategies were used to decrease the environmental impact of the building and support the educational goals of the project. The criteria and best practices of the Collaborative for High Performance Schools were used as a guide and a benchmark throughout the design process. One of the primary strategies was the inclusion of balanced daylighting throughout the building. Coupled with high performance lighting with daylight controls, daylighting can significantly reduce the energy used for lighting. Research has also proven that daylight better supports learning and student performance.

As the spaces in the Student Union were designed, the team paid particular attention to bringing daylighting into each space while also managing heat gain and glare. This was a challenge because the site conditions mandated that much of the building's glazing was on the east and west facades. The team utilized their integrated design strategy and advanced BIM tools to design a variety of solutions to the daylighting problem. The design combines a variety of glazing options and sun-shading devices at different locations throughout the building. Together these daylighting measures create spaces that are brightly lit but have controlled glare providing excellent environments for a variety of academic activities.

## High Performance Design

To minimize the impact on the global environment and improve the quality of the learning environments, many high performance design materials and features were employed:

- High recycled content.
- Linoleum flooring, made with natural, rapidly renewable linseed oil
- Low VOC paint, carpet
- Low maintenance/low water plantings
- Irrigation systems with bio-filtration

Working with the material selections and daylighting the design team designed efficient building systems. The mechanical systems are designed to exceed California's strict energy performance standards and provide excellent air distribution and air quality. Controlled by a campus wide energy management system that allows the maintenance staff to control the mechanical systems and easily shut them down when spaces are not in use, the lighting systems use direct-indirect linear fluorescent fixtures that provide an even distribution of light for a variety of tasks from reading to computer use.

Also integrated are lighting controls systems that automatically dim the lights to save energy when daylight is available in the space. Both the lighting controls and mechanical systems were included in the scope of work of the District's Commissioning Agent to ensure they were operating correctly and meeting the design criteria when the building opened. Together with Cupertino High School's existing solar photovoltaic (PV) system these building systems result in **a facility that uses very little energy from the utility grid.**

The design of the Quad and other site areas feature a number of high performance features. The landscaping and paving capture and filter storm water prior to it flowing to the storm drain system and into the nearby waterways. All drainage from the roof, walkways, and paving areas, are collected and run through specifically designed bio-filtration areas. These are designed with specially selected plant species and engineered soils to mimic the natural filtration process of wetlands and marshes. As water run-off slowly flows through this natural system contaminants are removed before it eventually flows into streams and San Francisco Bay.

Together these high performance features and design ideas were combined into a cohesive building that re-defines the identity of Cupertino High School.

The Student Union creates an inspiring new entry for the campus that displays the activity and academic excellence of the school to the community and invites them to participate. The high performance features demonstrate the school's commitment to the environment and the health and performance of their students while the variety of learning spaces supports the collaborative and innovative nature of the students and faculty. Together these features create a building that brings the atmosphere of a college and a high tech office park to Cupertino High School creating an inspiring place for students to learn and meet their goals.





## Results of the Project & Process



“This building exceeds any expectations or dreams of what a public high school structure can be AND it is what I wish all students could have when they come to school to learn.”

Polly Bove | Superintendent  
Fremont Union High School District

### Cupertino High School Student Union Goals:

- Provide a variety of dynamic learning spaces to support collaboration and variety of learning styles
- Replace outdated existing facilities with new functional spaces
- Incorporate a variety of high performance design principles to create a sustainable, healthy building
- Define a new entry and identity for an impressive high school whose architecture did not reflect its achievement
- To be an example of success for the start of a district wide building program



By working collaboratively the result is a dynamic building that met all of these goals. This process culminated in the Grand Opening of the Student Union on a sunny day in January of 2014. At that ceremony hundreds of students, alumni, community members, parents, and faculty heard how important this project was to the school, the District, and the design team. Many people expressed their amazement at seeing such an important building on their campus. After the ceremonial ribbon was cut members of the community toured the building and saw the indoor and outdoor learning spaces that will enrich the high school experience of their students to help them achieve their goals.



### STUDENT ENGAGEMENT & INSPIRATION

On March 15, 2014, student Ryan Lee, set out in the early morning to create a video of his new and improved campus. He strapped a GoPro Hero 2 video camera to a CF Tricopter and set it on a flight to capture the new buildings of Cupertino High School from above. [Flight over CHS](#) was shared online through Vimeo so students, teachers, administrators, and the community-at-large could join in Ryan's excitement and awe of this new learning environment.

The new Student Union is a hub for activity and now fully represents the culture and capabilities of the students of Cupertino High School.