AUTOMOTIVE LAB

SPACE DESCRIPTION

The Automotive Lab is designed to provide a versatile and collaborative learning environment for students to develop their technical skills in Automotive and Auto Body disciplines. In this space, students learn how to operate, diagnose, and repair vehicles using the latest equipment and technologies. A large open shop is the main training area, with additional instructional and skills labs adjoining the space for ease of movement and agile instruction. Support utilities such as 3-phase power and overhead exhaust are required.

The layout shown is illustrative of basic concepts and spatial needs should be adjusted according to each campus' specific requirements. The number of automotive bays required by the campus is the major design driver. Vehicle turning radii are fundamental to the layout and must be considered for the space to be successful. Some equipment, such as alignment bays require vehicle's wheels to be straight before entering lift. Verify all maneuvering requirements before designing the space. Oftentimes, industry and dealership partners offer apprenticeship programs, occupying the space alongside regular academic programs. Verify and provide for any specific partner requirements.

Outdoor facilities should include, at minimum, large overhead doors for movement of vehicles and an appropriately sized parking lot. A pair of EV charging stations should be considered for this area. A fenced service yard should be strongly considered for secure storage of vehicles and materials. Instructors regularly transfer vehicles in and out of the lab, and vehicle movement and maneuvering is critical.

SUCCESS FACTORS

Exterior Access: Overhead doors are critical for moving vehicles in and out of the Automotive Lab and must be located relative to the maneuvering requirements of the vehicle storage yard relative to the service bays.

Safety: Due to the hazardous nature of this work, Automotive Labs must be designed with safety as a top priority. The Labs must be outfitted with safety equipment and must comply with all relevant safety regulations and standards. Walkways through the space should be clearly marked, and equipment should be properly located to prevent harm. The lab should be designed to discourage students from using the overhead garage door as an entry point for the building.

Security: Vehicles, parts, tools and materials may be subject to theft. Provide PSEP cameras in key areas throughout the Automotive Lab, adjacent instructional spaces, and outdoor facilities.

Storage: Sufficient storage is essential for Automotive Labs. Secure rooms for tools, parts and supplies shall be supplemented by wall and cart storage in the labs.

GENERAL

All perimeter walls shall be full height to deck.

ADJACENCIES

Separate and/or adjacent space is required for the following: **Transmission/ Engine Lab, Alignment Bays, Wheel Service Lab, Classrooms/ Computer Labs, Tool Crib, Parts Storage, and Air Compressor. Additional space is required nearby for Offices, Conference Rooms, and building support.**

ACOUSTICS

Automotive Labs are naturally very loud spaces due to the activities in the space. Provide absorbent panels on walls and ceilings for noise reduction. STC-rated walls and Corridor buffer zones shall be used to decrease sound transmission to acoustically sensitive spaces.

Where Automotive labs border acoustically sensitive spaces, exterior walls should have a minimum STC rating of 50.

MECHANICAL

A ducted overhead vehicle exhaust system shall be provided at each maintenance bay. Electrical service, compressed Air, Gas, and Water shall be distributed within accessible reach at each bay. Distilled/ Reverse Osmosis water supply may be required. Verify specific needs on a project-by-project basis while planning for flexibility in the future.

- Outside ventilation and exhaust fans (plastic and metal) are required.
- Provide hose bibs, a sink with foot pedal or sensors, and emergency shower with eye wash in the main Automotive Lab.
- Provide floor drains/ trench drains in locations as required for certain equipment. A trench drain shall be centered along the length of the main Automotive Lab.
- Provide an oil/ water interceptor and separator with cleanout outside the building.

ELECTRICAL & DATA

- High voltage service is required. Provide flexibility for 120/208V 3-Phase and 480/277V 3-Phase, standard. Verify required voltages with planned and future equipment.
- Emergency shut-off switches are required at each bay for lifts, air compressors and other equipment as determined by program.
- Provide (2) Level 2 EV charging stations inside the Automotive Lab.

Provide power and data at 6’ intervals or in raceways along perimeter walls at locations which may be used for desktop computer workstations and/or lab equipment.

LIGHTING

Proper light levels are crucial in Automotive Labs.

- In high-bay areas, provide LED lighting in warm, soft white color.
- Task lighting is required at individual bays and workstations.

TECHNOLOGY

Access to technology is critical to develop skills in vehicle computer use and network communication. Students regularly utilize laptops for diagnostics throughout the shop. Verify specific needs on a project-by-project basis while planning for flexibility in the future.

- Provide Wireless capability throughout Automotive Labs and adjacent spaces with Wireless Access devices.
- Provide telephone service.
- Provide high-speed internet throughout, with dedicated data connections near tool and parts storage for tracking. Verify specific requirements.
- PSEP cameras are required for high value areas throughout the labs and outdoor facilities.
- Provide card reader/ key fob at entry doors and storage rooms.

ACCESSORIES AND EQUIPMENT

Equipment needs should be determined on a project-by-project basis while planning for flexibility in the future. At minimum, equipment shall include:

- Automotive electric lifts, floor mounted, with emergency shut off
- Alignment Racks
- Engine Blocks
- Equipment on rollers for flexibility (3 students/ trainer, typical)
- Air compressors
- Fire extinguishers
- Wall-mounted tack boards and marker boards

FURNITURE

Provide the following standard furnishings for Automotive Labs:

- Fixed Work benches with free-standing 4-shelf storage in the Transmission/ Engine Lab.
- Work tables and job boxes on rollers for flexibility and mobility.
- Wall shelving and storage racks on perimeter walls.

FINISHES

Ceilings

Recommended Height: 20’ clear with exposed structure. Provide acoustic panels for sound absorption. Consider durability for panels mounted lower than 8’ A.F.F.

Floors

Polished or sealed concrete slab (6” min. thickness) with slip-resistant finish. Epoxy floor coating is easily damaged and should not be used. Floors may be flat or low-sloped toward drains.

DOORS AND WINDOWS

Overhead doors for exterior access. 10’W x 12’H, typical.

Interior overhead doors for access between instructional spaces. 10’W x 12’H, typical.

Clerestory windows with E/W exposure, preferred. Place windows above 6’-0” high to reduce damage; or provide reinforced glazing/ window film.

TRANSMISSION/ ENGINE LAB

SPACE DESCRIPTION

The Transmission/Engine Lab is a specialized Lab space, open and adjacent to the main Automotive Lab, for a maximum of (16) students, (1) instructor and (1) assistant. Fixed work benches for Engine Blocks are dispersed throughout the space, with 4-shelf storage racks between for equipment and parts storage. Due to the use of extremely loud equipment, wall construction requires high STC rating and sound isolation. Provide sound absorptive panels on walls and ceilings.

Provide all utilities as required by the program.

Proper lighting is critical and shall be achieved with a mixture of high-bay LED lighting and task lighting at work benches.

Provide direct access to an adjacent Tool Crib/ Storage room and close proximity to Classrooms.

ACCESSORIES AND EQUIPMENT

Provide fixed work benches, free-standing shelf storage, and wall racks. Additional equipment on rollers shall be determined by program needs.

ALIGNMENT BAYS

SPACE DESCRIPTION

Alignment Bays are a specialized Lab space, open and adjacent to the main Automotive Lab. Two (2) alignment rack lift systems shall be provided. Additional lab equipment shall be on rollers for flexibility. Coordinate with the selected equipment to provide utilities.

Proper lighting is critical and shall be achieved with a mixture of high-bay LED lighting and task lighting.

Provide direct access to the Wheel Service Lab and close proximity to Classrooms.

ACCESSORIES AND EQUIPMENT

Alignment racks, 14'W x 25'L.

Additional equipment on rollers shall be determined by program needs.

WHEEL SERVICE LAB

SPACE DESCRIPTION

The Wheel Service Lab is a specialized Lab space, adjacent to the main Automotive Lab and Alignment Bays, for the balance and maintenance of wheels and tires. Lab equipment shall include wall storage and shelving, with additional equipment on rollers for flexibility.

Provide all utilities as required by the program.

Proper lighting is critical and shall be achieved with a mixture of high-bay LED lighting and task lighting at work benches.

Provide direct access to an adjacent Automotive Lab and Alignment Bays.

ACCESSORIES AND EQUIPMENT

Tire and Wheel balancing equipment

TOOL CRIB

SPACE DESCRIPTION

Directly adjacent to the Automotive Lab, the Tool Crib provides a secure location for the storage of tools, parts and supplies. The crib should be secured by walls, or secure fencing. A workstation with power and data shall be provided for use by a lab technician for tracking tools and parts.

Additional equipment includes tool chests, shelves and cabinets.

Provide double doors with key fob access.