# **Transportation of Research Chemicals on the WSU Campus**

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## Purpose:

When moving chemicals on campus, research personnel must ensure that transportation is performed in a safe manner, and in compliance with local, state, and federal regulations. The Office of Environmental Health and Safety (OEHS) has provided guidance below on key items that must be considered prior to, and during, transportation of chemicals on campus. Movement of large quantities of chemicals (e.g., single container of greater than 5 gallons or a total volume of 50 gallons across multiple containers), or many chemical containers (e.g., lab moves) must be coordinated through OEHS.

## General:

### What is being transported?

* + Identify how the chemicals are to be transported ahead of time. Plan ahead and be prepared!
	+ All individuals involved must have received Hazard Communication and Laboratory Safety Training. Training is available through the [Collaborative Institutional Training Initiative (CITI Program)](https://about.citiprogram.org/).
	+ All individuals involved must be familiar with the chemical and the associated hazards.
		- Review the Safety Data Sheet (SDS) for key safety considerations.
		- Contact OEHS if you have concerns regarding moving a specific high risk chemical.
	+ Does this chemical have storage requirements that need to be maintained? (i.e., temperature, light sensitivity)

### Route planning:

* + Within a building or between buildings?
		- Can the chemical be transported by vehicle? (See below for information on determining if a chemical can be transported via vehicles)
		- Public transportation **cannot** be used for transportation of chemicals.
	+ Avoid high traffic areas when transporting chemicals.
	+ Is the chemical safe to be transported along the required route (physical and environmental conditions)? (i.e., explosive, shock sensitive chemicals)
	+ Chemicals must always be supervised. Avoid unnecessary stops on your route.
	+ Use freight elevators where possible and do not allow other passengers to ride with the chemicals being transported.
	+ Elevator keys may be available to ensure safe transportation between floors – discuss with your building coordinator.

### Packaging:

* + Chemical containers must be clearly labeled with the full English name.
	+ Utilize secondary containment (e.g., rubber pails)
	+ A secondary container must be capable of containing the materials if the primary container should fail.
		- Never transport incompatible chemicals in the same secondary containment.
		- Suitable absorbent materials must be included in the secondary container to absorb any liquids should the primary container break or leak.
		- Consideration must be given to the compatibility of the absorbent materials with the chemical(s) being transported.
	+ Ensure that packaging addresses storage requirements (e.g., temperature) and include ice packs/dry ice as necessary.
	+ If transporting multiple chemicals:
		- Utilize a sturdy cart, with side rails, at least 2 inches high.
			* Secondary containment must still be used.
			* Ensure the wheels of the cart are functional and suitable for the expected ground/flooring conditions.
		- Cushion or separate the materials to prevent container breakage.
	+ Include on the outside of the secondary container or carry documentation with the following:
		- Emergency contact information: Name and phone number of Principal Investigator or responsible party.
		- Safety Data Sheet for the chemical(s) being transported.

### Emergency Response Information:

* + Have appropriate emergency contact information available.
	+ It is prudent to carry a cell phone in case of any problems or emergencies along the way.
	+ In the event of an emergency (e.g., spill, accident, or primary container failure) during transportation WSU Police must be called – (313) 577-2222
		- WSU Police will coordinate spill response with OEHS.
	+ If there is a non-emergency during transportation, contact the Office of Environmental Health & Safety (OEHS) during normal business hours (M-F, 9 am to 5 pm) on (313) 577-1200.
		- After normal business hours contact OEHS via WSU Police – (313) 577-2222
	+ If above packaging requirements are adhered to, Personal Protective Equipment (PPE) is **not** required during transportation. It is recommended that appropriate PPE be transported with the chemical.

## Can the chemical(s) be transported in a vehicle?

* Public transportation **cannot** be used for transportation of chemicals.
* Electric scooters and bikes **cannot** be used for transportation of chemicals.
* Determine if it is regulated by the Department of Transportation (DOT) by examining the SDS for your specific chemical(s) – section 14: Transport Information.
	+ DOT (US) – is it listed as dangerous goods?
		- If a UN number is provided, plus additional hazard classification information, then this is a DOT regulated chemical.
		- Chemicals not regulated by the DOT will provide information to the effect of “Not dangerous goods”.
	+ Confirm that the chemical is not regulated by consulting the DOT [Hazardous Materials table.](https://www.ecfr.gov/current/title-49/subtitle-B/chapter-I/subchapter-C/part-172/subpart-B/section-172.101%22%20%5Cl%20%22p-172.101%28l%29%283%29)
		- If your chemical is not on the list, it is not regulated by the DOT.
	+ Contact OEHS if you need assistance making this determination.

### DOT regulated chemicals:

* + Chemicals **cannot** be transported by vehicle and must be moved on foot (or cart).
	+ Account for adverse weather conditions and the distance that needs to be transported.
	+ Explore options for delivery of the chemical directly to the desired location when ordered.
	+ Contact OEHS for assistance on movement of DOT regulated chemicals – (313) 577-1200

### Non-DOT regulated chemicals:

* + Where possible, OEHS recommends that these chemicals are moved on foot (or cart).
	+ If moving by vehicle – use of a WSU State Vehicle is strongly recommended.
	+ Provide the driver with a copy of the list of materials being transported.
	+ Package the materials securely, as described above, using secondary containment.
	+ Transport the chemicals within the trunk, or bed of a pick-up truck.
	+ For security and safety purposes, drive directly to the destination along the most direct route possible.

## Additional Considerations:

### Dry Ice:

* + Dry ice is not regulated by ground transportation under DOT.
	+ Dry ice **must never be in an airtight, sealed container** (e.g., a jar with a threaded lid).
	+ Package integrity: A package containing dry ice must be of adequate strength for intended use. It must be strong enough to withstand the loading and unloading normally encountered in transport.

### Compressed Gases and Cryogenic Materials:

* + Between buildings:
		- Must be transported between buildings by an approved vendor only.
	+ Within a building:
		- A gas cylinder hand truck or cart **must** be used for transportation of cylinders.
		- Cylinders must be secured to the hand truck in an upright position. (i.e., do **not** lay cylinders horizontally on a standard cart for transportation)
		- Regulators must be removed, and valve caps replaced prior to transportation.
		- Where available, use of a service or freight elevator is recommended.
		- When using an elevator:
			* Post a sign on the cylinders reading “Do Not Enter – Gas/Cryogenic Material Transport”.
			* Have someone ready on the receiving floor to ensure prompt removal of the cylinders.
			* Elevator keys may be available to ensure safe transportation between floors – discuss with your building coordinator.

### Forbidden Chemicals:

* + Some materials are designated by the US Department of Transportation as “forbidden” hazardous materials. These materials are banned from transportation and must never be transported in state vehicles or private vehicles.
		- [Forbidden Materials | PHMSA (dot.gov)](https://www.phmsa.dot.gov/international-program/forbidden-materials#49%20CFR%20173.21%20Forbidden%20Materials%20and%20Packages)
		- [eCFR :: 49 CFR 172.101 -- Purpose and use of hazardous materials table.](https://www.ecfr.gov/current/title-49/subtitle-B/chapter-I/subchapter-C/part-172/subpart-B/section-172.101%22%20%5Cl%20%22p-172.101%28l%29%283%29)

## References:

Code of Federal Regulations, Title 49: [eCFR :: 49 CFR 172.101 -- Purpose and use of hazardous materials table.](https://www.ecfr.gov/current/title-49/subtitle-B/chapter-I/subchapter-C/part-172/subpart-B/section-172.101)

US Department of Transportation: [Forbidden Materials | PHMSA (dot.gov)](https://www.phmsa.dot.gov/international-program/forbidden-materials#49%20CFR%20173.21%20Forbidden%20Materials%20and%20Packages)

University of Delaware: [Procedures for Transporting Chemicals](https://www1.udel.edu/ehs/research/chemical/transport-chemicals.html)

University of Michigan: [Chemical Hygiene Plan](https://ehs.umich.edu/wp-content/uploads/2016/03/ChemicalHygienePlan.pdf)