

# Docent Handbook

Revised: 7/28/10 by Chad Krivin

## Lobby Gallery

The lobby provides an introduction and an overview to orient you to what you will see here at America on Wheels.

As you entered the museum (in the vestibule) you may have noted the **Mack Truck Display Case**. It contains a series of **Commemorative Model Trucks Celebrating Mack Truck History**. Mack has been a major, local manufacturer of large trucks since 1905 when it moved here to Allentown. These trucks are unique because they were a prototype set which never was placed in production. Each truck discusses significant developments in Mack's history. Go ahead and read them, as they are quite interesting. What you may not know, is the story on how the Mack Company came to have the bulldog as their mascot. The 1918 AC model was built for World War I. This truck earned the name while it was over seas in France with the British. The front design and its' ability to do large amounts of work reminded them of their national symbol, the bulldog. The rest, as they say, is history.

Immediately adjacent to our entrance is a Bonneville Salt Flats motorcycle. The Bonneville Salt Flats are located in Utah and stretch over 30,000 acres. Every year, many people go out to try and set new land speed records with automobiles and motorcycles. The very first unofficial record was set in 1914, by Teddy Tezlaff, who drove a Blitzen Benz at a speed of 141 mph.

This motorcycle is a current record holder from 2009, with a speed of 133.165mph.

One of the major display areas we have is on the evolving technology of the automobile and the role alternative fuels have and are playing in that evolution. A very nice example of this is the **1922 Detroit Electric**. This beautiful car was one of the most elegant electric powered automobiles of this era. One of the custom touches on this car is the curved glass, which was expensive to make. The Detroit Electric was known for being able to travel an average of 80 miles per charge, at a speed of 20mph. Doctors and women preferred these cars over gasoline power because they were cleaner and easier to use.

The theme of the next area of our Lobby gallery is "**What's my Story?**" To introduce the next five vehicles, we have an interactive display board titled: "If Wheels Could Talk – Every Vehicle Has a Story to Tell; About People". I will give you a few details but feel free to come back after the tour and read the stories.

The first vehicle you see here is a 1933 Hupmobile. Hupmobiles were built from 1909 to 1940 by the Hupp Motor Company. The 1933 Hupmobile was designed by famous designer, Raymond Loewy. He is very well known for designing the Studebaker Avanti. This car is only one of 5 known to exist today out of the 4,600 units built.

- The second vehicle represents bicycles. It is a **2007 Pro Machine Bicycle**. This Hi-Tech racing/touring bicycle is a model SLC01 BMC. In 2007, BMC racing team member Jonathan Garcia rode this bike while earning the leaders jersey in

Giro Di Friuli Venezia-Giulia, a five day, Italian stage race. During the race, Garcia and his teammates also became the first group solely represented by Americans to win a European team time trial. While the BMC team is fairly new, their 2007 victories leave them poised for even greater success in the European stage. Pro-cyclists want the lightest, most durable bicycles available. The Easton Carbon Fiber Nanotechnology used in this bicycle frame represents the cutting edge in cycling technology. The BMC frame weights about two pounds, less than half of what a traditional steel racing frame weighs.

- Next, representing luxury sports cars, we have a **1984 Zora-1 Chevrolet Corvette**. In 1953, Chevrolet hired Zora Arkus-Duntov to be involved in the car's development. He retired in 1975 as a legend of the Corvette world after saving it from an early death in 1955 and transforming it from a beautiful car that dealers couldn't sell to one of the most popular and powerful sports cars in the world. This particular vehicle was created for the "Father of the Corvette".

- Representing motorcycles, is a **1950 Harley-Davidson FL Hydra-Glide**. Following sales of over 90,000 motorcycles to the US Army in WW II, Harley-Davidson rose to dominate motorcycle sales in the post WW II period. The 1948 – 1965 FL series motorcycles directly evolved from the earlier iron head FL's of the 1936 – 1947 period, known affectionately as "knuckleheads". The new FL models were instantly recognizable by the sheet metal valve covers and became known as the "Panheads".

*[Note to Docents – As the design of Harley-Davidson engines has evolved through the years, the distinctive shape of the valve covers has allowed Harley enthusiasts to classify an engine simply by looking at the shape of the cover. A knucklehead engine has round knobs on the cover resembling knuckles that give the knucklehead its name. The Panhead engine has covers resembling an upside-down pan, thus its name.]*

- In the back of the area, representing the future of personal transport is a **2002 Segway Human Transporter**. Dean Kamen's vision of the future hopes to make transportation as simple as

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possible. For starters, the Segway uses around the same amount of space as a person would on the street. It's fast enough to be convenient, but it can avoid pedestrians and danger with instant turns and stops. It aims to deliver a natural, easy driving process that's based in a person's balance. The Segway has a top speed of 12.5 mph and a range of 24 miles. It weighs 97 pounds.

- Representing the working truck, is a **1919 Mack AB Truck**. This Model AB truck was originally delivered to Barnett & Garlington of Spartansburg, South Carolina on October 14, 1919. After many years of active service, it was restored by employees of Smith Transfer of Staunton, VA. It is powered by a Mack Ab 4 cylinder cast pairs gasoline engine which produced 25.6 horsepower. It has four forward and one reverse speeds and weighs 1 ½ to 2 tons. Note the wood spoke wheels and solid rubber tires.

Next to the Mack Truck, we have one of Iacocca's **E-Bikes**, a product of EV Global Motors. This bike has a top speed of 15 mph and a range of 20 miles between recharging at wall outlets. It has features such as cruise control and can be powered by a combination of human power and electric. At the time of its manufacture, it was considered the top of the line. It represented quality electric bikes and often performed very well.

- In front of the Mack truck, we have a large model of the famous **Mack Bulldog**. The Mack AC truck came into production just in time for extensive use in World War I by the British, French, and American Forces. The British soldiers liked the AC best of all the vehicles in the war. The stub nose appearance of the hood and tenacious performance of the AC reminded the British soldiers of their national symbol, the British bulldog. They nicknamed the AC's "Bull Dog Macks". The familiar Mack Bulldog hood ornament was designed by Mack Chief Engineer A. F. Masury. While recuperating in the hospital, he carved the bulldog out of a bar of soap. On October 11, 1932, Mack received a patent for the design. The Bulldog went on to become the Mack Corporate symbol and has been a part of the new Mack trucks since 1933.

*[Note to Docents – depending on the tour group and activities at the time, you may want to point out through the office doors the Art Deco styling in the original A&B office.]*

*(Note to Docents – depending on the tour group, you may want to take the opportunity to point out the location of the rest rooms.)*

Also located in this corridor are a **Mack Tandem Axle Drive Train** and a **Mack E7 Cutaway Engine**. The E7 was introduced in 1988 and is a 12 liter, six cylinder diesel originally offering from 250 to 400 horsepower in both standard and high-torque-rise Maxidyne versions. The E7 family has evolved throughout the next decade – with the addition of electronic unit pump technology and a number of other sophisticated electronic features.

Just in front of our gift shop, we have a number of displays about the PA Turnpike System and its local impact on the Lehigh Valley:

- The New American Highway
- A Tour Through the Dream Highway
- PA Turnpike System – the Worlds Greatest Highway
- Making the World Smaller
- On the Road in the Lehigh Valley
- Reshaping the Lehigh Valley
- Around and About Allentown
- Name this Location

Behind the Turnpike booth we have a display with more aspects of the **PA Turnpike**, America's first super-highway, including a video and pictures of its construction, a display case containing Turnpike memorabilia.

On the building column is a display, **On The Road in Allentown**. These pictures are “old time postcards scenes” of various locations around Allentown. *[Note to Docents – you may want to point out that actual postcards of some of these pictures are available for purchase in the Gift Shop].*

Turning our attention upward for the moment, over the admissions area, you will note a **Park and Shop parking sign**. Older Lehigh valley residents will be familiar with this sign. During the prosperity years following World War II, the two car family emerged. Several business leaders of Allentown realized both the parking problem and the potential to enhance sales. Park and Shop was begun by Harvey Farr, Donald Miller and John Leh. The current small parking deck at 10th and Hamilton, above the Parking Authority Office, was the first deck in the country. To make the parking lots, houses were purchased and torn down. Merchants would stamp the parking tickets, providing free or reduced cost parking. Eventually the suburban shopping malls eroded the commerce on Hamilton Street and as the viability of the Park And Shop enterprise declined, the Allentown Parking Authority was formed, and it purchased the lots, and has sold several essential neighborhood lots to a contractor for new housing.

Located above the gift shop, we have a number of **Truck Models**. This unique collection of truck models and old toy trucks was donated by Jackie Jordan, wife of the late Matty Jordan, owner and Matteo's famous restaurant in the Brentwood area of Los Angeles. Matty, a personal friend of AOW President, Jack Curcio, catered to the biggest stars of “old Hollywood”; stars like Frank Sinatra who considered Matteo's his favorite place to dine. Each evening, after closing his “JOINT” as Matty called the restaurant, he relaxed at home building these wonderful models, replicas of trucking companies he knew of in his youth where he grew up with Sinatra in Hoboken, New Jersey. A limited number of these models are available for purchase in our Gift Shop.

Back in the central area of the lobby, we have a **1963 Ford Mustang** concept car. This concept car is introducing our next display for our changing gallery upstairs – Muscle Cars.

*[Note to Docents - from this point you can continue the tour by going down the 1<sup>st</sup> floor corridor or by going upstairs or if this is the end of the tour you can give your wrap-up]*

#### Reference Statistics

##### 1933 Hupmobile

- ☐ Number Produced: approx. 4,600 (all models) in 1933, however convertible coupe model is quite rare
- ☐ Years of Production: 1909 - 1940
- ☐ Engine: 228 cubic inch straight six
- ☐ Price: \$990
- ☐ Built by: Hupp Motor Company
- ☐ Interesting facts: One of five known to exist, designed by Raymond Loewy, who designed the Avanti.

##### 2007 Pro Machine Bicycle

- ☐ Frame: Easton EL90, full carbon
- ☐ Brakes: Shimano Dura Ace Duel Pivot

- ❑ Shifting System: Shimano Dura Ace 10 Speed
- ❑ Crankset: Shimano Dura Ace
- ❑ Saddle: Selle Italia
- ❑ Wheels: Shimano WHR600 Aluminum Clincher
- ❑ Tires: Schwalbi Clincher
- ❑ Interesting facts: Team size varies but normally takes 30 people to ran BMC team (16 Racers, 1 GM, 1 Diecteur Sportif, 1 Trainer & Coach, 4 Mechanics, 4 Masseurs + Admin staff)

#### 1984 Zora Duntov Corvette

- ❑ Number Produced: Total Corvettes for 1984 = 51,547
- ❑ Years of Production: 1953 - present
- ❑ Engine: 205 hp, 5.7 liter, V8 with 290 lb ft of torque
- ❑ Dimensions: wheelbase 96.2", length 176.5"; width 71.0", height 46.7". weight 3088 lbs
- ❑ Technical: disk front brakes; disk rear brakes; Transmission unusual 4=3 which combined a 4- speed manual with automatic overdrive on the top three gears
- ❑ Top Speed: 124 mph; 0-60 in 7.0 sec; ¼ mile in 15.5 sec
- ❑ Price: \$ 21,800 (for standard 1984 Corvette)
- ❑ Built by: Chevrolet (General Motors)
- ❑ Interesting facts: customized for Zora Arkus-Duntov, designer of Corvette (known as father of the Corvettes)

#### 1950 Harley-Davidson Motorcycle

- ❑ Engine: FL series; 74 cubic inch (1200cc), 3 7/16" bore
- ❑ Dimensions: wheelbase 59 1/2", weight 560 lbs
- ❑ Technical: Transmission – 4 speed unit with hand gear change and a foot clutch, both primary drive and final drive were attained by roller chains; 1 5/16: Schelber carburator; 5"X16" balloon tires
- ❑ Built by: Harley-Davidson
- ❑ Interesting facts: Following sales of over 90,000 motorcycles to the US Army in WW II, Harley-Davidson rose to dominate motorcycle sales in the post WW II period.

#### 2002 Segway Human Transporter

- ❑ Engine: 2 High Torque electric motors, one on each wheel, 1500 watts each, develop 2+ hp each
- ❑ Dimensions: footprint 19" X 25", weight 97 lbs
- ❑ Technical:
- ❑ Top Speed: 12.5 mph, Range 24 miles
- ❑ Built by: Segway, Inc.
- ❑ Interesting facts: Driving process depends on persons balance (lean forward to accelerate, tilt backwards to stop)

#### 1919 Mack AB Truck

- ❑ Number Produced: total all years = 51,000
- ❑ Years of Production: 1914 - 1936

☐ Engine: Mack AB 4 cylinder Cast Pairs Gasoline, Displacement 251 cu in, Bore 4", stroke 5', 25.6 hp

☐ Technical: Brown-Lipe transmission, 4 forward speeds, 1 reverse speed, worm, Timken Worm Drive, Rear Axle Ratio 9.25, wood spoke wheels, solid rubber tires – front 36"X4", rear 36"X8" Dual, Vehicle Weight Rating 1 ½ to 2 tons.

☐ Built by: Mack Trucks

Mack E7 Diesel Engineering

☐ Number of Cylinders: six

☐ Displacement: 726 cu in ( 12 liters)

☐ Valves per cylinder: four

☐ Bore and Stroke: 4.575" X 6.5"

☐ Available Power Rating: 250 – 300 hp

☐ Maximum Torque Output: 1560 lb ft @ 1250 rpm

☐ Engine Weight: 2300 pounds

Interactive displays and videos

- What's my Story Interactive – Flip book linking opening display vehicles to other exhibits in the museum

- Can you name this location Interactive – Images of auto-related Allentown places with answers under flips

- Pa Turnpike Construction Video

## 1<sup>st</sup> Floor Corridor Gallery

We begin our trip down the corridor with the theme “**The Romance of the Road** – there's more than one way to move down the road”. We love our vehicles and love to use them. This area is dedicated to our use of wheeled vehicles for recreation. In the first exhibit we have three examples of vehicles for enjoying the open road – the bicycle, the sports car, and the motorcycle.

Beginning with the sports car, we have the prototype of what became one of America's iconic vehicles for experiencing the romance of the road – the Ford Mustang. This Mustang Concept car is on loan from the Detroit Historical Museum. The **1963 Pre-production Mustang** is basically the same car that would be introduced as the 1965 Mustang. This particular car was altered and exhibited at a number of auto shows. It is equipped with a 289-cubic inch, high performance, Cobra-modified engine and four speed manual transmission. It is a convertible equipped with removable fiberglass top. In fact, this car was on display in the New York International Auto Show in 1964 without the fiberglass top.

*[Note to Docents – Cobra modified engine refers to engines produced, under contract to Carroll Shelby, for racing and other high performance purposes. Shelby sold the trade name “Cobra” to Ford in 1965.]*

As Ford's Vice President and General Manager (became VP in 1960, Exec. VP in 1967, and President from 1970-1978), Lee Iacocca's (by the way, an Allentown native) was the driving force behind the development of the Mustang. Iacocca formed a team who designed the Mustang at a time when foreign cars were gaining substantial market share for the first time in American auto history. The team researched, designed and developed the entire car in secret, even from the company's President, Henry Ford II. Iacocca knew that America's young and aging alike, wanted something new, something sporty, and yet affordable. The Mustang was the answer. Fighting Henry Ford II virtually every step of the way, Iacocca wore Ford down through persistence borne of his confidence that the Mustang would be the car of choice in America. The Mustang was an instant success with 417, 000 selling in its first year.

Many people remember that Lee Iacocca, after leaving Ford, became head of Chrysler Corporation and was instrumental in turning the company around in the late 1970's but not many know that following his retirement from Chrysler, he founded, in 1996, EV Global Motors, a company formed to develop and market electric bikes. The E-Bike next to the Mack truck is a product of Global Motors.

Now turning our attention to the other side of the corridor, we have a video on “**Selling a Dream**” showing examples of Automotive TV Commercials.

*[Note to Docents – This would be a good opportunity to engage the tour in a discussion by asking them to tell you the car ads they most remember.]*

Speaking of dreams, many children dreamed of the streamlined styling of Schwinn's Panthers and Phantom model bicycles in the 1950's. Pee Wee Herman



relived that dream in the 1985 movie, Pee Wee's Big adventure. This **schwinn bike** is a replica of the movie's prop bike.

Next we have a salute to one of America's most famous roads – **Route 66**. Next to this we have an area where we encourage our guests to write a short note on one of their memories where they experienced the freedom of the open road.

*[Note to Docents - you may want to point out the elevator to the second floor]*

In this side corridor we have several wall mounted display cases showing a collection of **Pennsylvania Motor Vehicle License Plates** ranging from 1908 to 1958, a collection of **Various State License Plates**, a collection of **Police Department Patches** and a collection of **Fire Department Patches**.

Check out these collections and see if your state and local department is represented. *[Note to Docents*

- *you may want to ask our guests if they have anything they would like to donate to these collections.]*

Turning our attention across the aisle, we note that our love of vehicles is not limited strictly to on road. As the video shows, off-road racing has become quite popular. The popularity of British off-road events called “scrambles” in the 1920's and 1930's led to an increase in off-road competitions in Europe and the U.S. Today motocross is a motor activity embraced avidly by skilled professionals and enthusiast families, for competition and, increasingly, recreation.

This **Suzuki RM250ZK6 Motorcycle** (*on the wall*) is a replica of a bike that helped 15-time AMA Champion rider Ricky Carmichael enjoy both the process and the results of racing. Racing from 2005 to 2007 for Team Makita Suzuki, Carmichael has earned the title of “arguably the greatest rider of his generation.

The sharp looking dirt bike beneath it is a 1978 Harley Davidson MX250. This idea started in the late 1970s, when Harley decided to test the market with its first-ever moto-cross bike. The end result was a one-of-a-kind bike that only lasted one year.

Mountain bikes were widely introduced in the 1980's and quickly became best sellers. Lightweight frame materials, hydraulic shocks, 24 speeds, and knobby tires have made cycling in off-road conditions practical and fun. With their full-suspension frame and non-traditional front fork, this **2000 Raven 700SX Mountain Bike's** (*mounted high on the wall*) startling style draws plenty of attention. The Raven bike is manufactured by Cannondale of Bedford, PA. Off road racing is not limited to only two wheels. Representing off-road, four wheel racing, we have a **1939 Wendling Midget Racer**. This midget racer was born in nearby Macungie, PA at the hands of Bob and George Wendling, brothers who honed their skills working for the Fleetwook Body Works of Fleetwood, PA (another PA contributor to the automotive history but that's another story!) Their skill is apparent; the hand-hammered sheet metal body seamlessly meshed a bent Packard grill up front. Ingenuity shines in the racer's rare features like a parallel-spring rear suspension and front-wheel drive

(accomplished by flipping a Ford Model T's rear-end backwards and upside-down). A Franklin steering box was salvaged to handle inputs from the handmade steering wheel. The most unique touch? The racers engine was a 91 cubic inch Van Blerck boat engine, adapted to a car by turning it around and cutting off its exhaust manifold. This racer was designed for dirt tracks and raced at Dorney Park Speedway.

Next we have an area dedicated to the Lehigh Valley Timing Association (LVTA) a local organization formed in the 1952 to promote save driving and give credibility to the term "Hot Rodder". Through their efforts, rights were obtained to use Convair Field Airport (which later became the Queen City Airport here in Allentown) as a dragstrip. The LVTA successfully ran the Convair Field Drags in the first Sunday of each month in 1955 and 1956. Some of the "firsts" that were associated with Convair are:

- ☐ One of the first stops for the NHRA Safety Safari
  - ☐ First sanctioned drag strip in PA
  - ☐ Site of the first side by side drag race in PA
  - ☐ On August 21, 1955, the NHRA Regional Championships were run there
- LVTA went on to sponsor racing at the Vargo Dragway in Perkasio in the early 1960's.

LVTA remains active and provides many of the AOW volunteers.

We have several showcases featuring jackets, patches, pictures, and memorabilia from the LVTA along with more information about Convair Field. LVTA has dedicated their display area to the individual credited with starting their organization, a local radio station personality by the name of Luther "**Dopey Duncan**" Gehringer (1920-1990).

Dopey served as mentor to the young men of the organization. In this display, Dopey is shown working on a **1940 Mercury Customized Hood**.

*[Note to Docents – Dopey Duncan was the stage name, Luther chose to use to describe his comical, "dumb Dutchman" character that he played for his audiences. Dopey's character had a well developed schtick and a devoted audience, and he really could encapsulate the Dutchie persona. This persona included an outrageous costume - featuring a checkered suit, goofy hat, string bow tie and oversize yellow shoes.]*

In front of Dopey is an example of a custom made Hot Rod of the time period.

This 1958 Custom Hot Rod Drag Racer was built by Bob Wuscher and Charlie Engert. It was nicknamed "**Bloody Mary**" and was actively used until 1965 competing in drag strips in Pa, NJ and DE. It won a national championship in the D/Altered class. It was initially equipped with a 316 cubic inch Canadian block flathead. It had both a Hilborn fuel injected setup or a quad(4) carburetor manifold at times. The engine was later changed out to a straight 8 Buick. The car was stored in a barn, then disappeared for a time after being stolen. It was recovered and was resurrected in 2005. Note the Neuweiler Beer overflow for the radiator. Neuweiler's brewery building still exists a few blocks from our museum.

*[Note to Docents – at this point you may direct the visitors to the North Gallery, the Stairway to the second floor, or continue down the corridor to the South Gallery. If you depart the corridor now, you can pick up the story on your return.]*

We now shift themes as we prepare to enter the South Gallery. This area provides an introduction to one of the themes of our South gallery – Working vehicles.

First, we have with a **1918 Mack AC Fire Truck**. This fire truck was originally a dump truck destined for the European battlefields of World War I. The war ended and many chassis became surplus. The City of Baltimore bought 12 chassis in 1921. In 1923 the Baltimore Fire Department installed the 600 gallon per minute pump and body. From 1923 until 1947, it answered all calls in the industrialized Canton area of Baltimore. From 1947 to 1958, it served as a reserve apparatus. Note the hand crank starting, the chain drive and the acetylene gas headlamps and spotlight. Also note the truck is connected to a real **Darlington Valve Fire Plug** (manufactured by Darling Valve Co – originally from Williamsport, PA and now located in Texas) and is ready to pump water! Mack built over 10,000 fire trucks from 1911 through 1990.

Next, we have a smaller version: a **1930's era Steel- Craft Pedal Car**. This rare pedal car was found in a scrap heap in Massachusetts in 1979. The Gwozdz family proudly displayed this 1930's era toy on their property until donating it to the Mack Museum in 2003. The Fire Truck was then restored by the Museum Staff to its nearly original condition and in 2008 was lent it to America on Wheels to display along side the 1918 Mack Fire Apparatus.

Now we will continue our theme of working trucks in the South Gallery.

Reference Material

E-Bike

- ☐ Number Produced: Over 12,000
- ☐ Years of Production: 1999 - 2002
- ☐ Engine: Combination of Human Power and a 24 volt, 235 watt, 35 pound, detachable, battery powered, DC electric motor
- ☐ Top Speed: 15 mph, range 20 miles between recharges
- ☐ Price: \$ 995
- ☐ Built by: EV Global Motors (built in Taiwan)
- ☐ Interesting facts: EV Global founded by Lee Iacocca,

Prototype Mustang

- ☐ Number Produced: 2 prototypes
  - ☐ Years of Production: 1963
  - ☐ Engine: water cooled, V8, 4" bore, 2.67 in stroke, 289 cu in displacement, high performance,
- Cobra-modified
- ☐ Transmission: four speed manual
  - ☐ Dimensions: length 186.6 inch , width 68.2 inch , height 48.4 inch
  - ☐ Price: NA
  - ☐ Built by: Ford Motor Co.

❑ Interesting facts: It is a convertible equipped with removable fiberglass top (This car was on display in the New York International Auto Show in 1964 without the fiberglass top); 417,000 selling in its first year.

#### Suzuki RM250ZK6 Motorcycle

❑ Engine: 249cc, four stroke, single cylinder, liquid cooled.  
❑ Dimensions: wheelbase 58.1 inch, length 85.4 inch, width 33.1 inch, height 50 inch, weight 204 pound

❑ Technical: 5 speed transmission

❑ Built by: Suzuki

❑ Interesting facts: replica of the bike that helped 15 time AMA Champion rider Ricky Carmichael enjoy the process and the results of racing from 2005 to 2007 for Team Makita Suzuki 1939 Wendling Midget Racer

❑ Engine: Van Blerck all aluminum marine engine, 91 cu in, 4 cylinder, 16 valve, single overhead cam.

❑ Dimensions: wheelbase 74.5 inch, length 103 inch, width 53 inch, height 40 inch

❑ Technical: single speed transmission

❑ Built by: Bob and George Wendling of Macungie, PA

❑ Interesting facts: designed for dirt tracks, raced at Dorney Park Speedway in Allentown

#### 1958 Custom Built Hot Rod

❑ Years of Production: 1958

❑ Engine: Original - 316 cubic inch Canadian block flathead. The engine was later changed out to a straight 8 Buick.

❑ Built by: Bob Wuscher and Charlie Engert

❑ Interesting facts: this car raced from 1958 to 1965 competing in drag strips in Pa, NJ and DE. It won a national championship in the D/Altered class. Note the Neuweiler Beer overflow for the radiator. Neuweiler's brewery building still exists a few blocks from our museum.

#### 1918 Mack Model AC Firetruck

❑ Number Produced : Total Model AC = 40,299; number of AC Firetrucks = NA

❑ Years of Production: 1916 - 1938

❑ Engine: Mack AC four cylinder Cast pairs gasoline. Displacement 471 cu in, 5" bore, 6" stroke, 74 hp

❑ Technical: Transmission – Mack AC with integral differential and jackshaft, 4 forward speeds, 1 reverse, chain drive

❑ Built by: Mack Trucks

❑ Interesting facts: 600 Gallon per minute pump, acetylene gas headlamps and spotlight, solid rubber tires, wood spoke wheels, hand crank starting

#### Interactive displays and videos

- What's your style video

- Selling a Dream video – ATV commercials from the 60's and 70's

- Memories in Motion Interactive – Visitor feedback – they can post a response to questions

shown on the graphic panel above the writing shelf.

- Motocross Action Clips video
- Μουνταιν Βικε Αχτιον Χλιπς πιδεδ
- Lehigh Valley Timing Association Video – early footage from LVTA races
- Building strong Communities Interactive – Visual flipbook survey of Mack fire and specialty trucks

## South Gallery

*[Note to Docents – entering the gallery go up the ramp to the left]*

The theme for this gallery is “Vehicles – at Work and at Play.” Continuing on the “At Work” theme set in the corridor with the Fire Truck, we now move to “Moving the Goods”.

Our first exhibit is probably familiar to all of you, a familiar brown UPS truck. This truck is a **1977 Mack F785T UPS Cab and Trailer**. This UPS single drive axle F Model was typical for fleets such as UPS; it was used mainly in terminal-to-terminal runs. Some heavier F Models were used in construction applications such as large concrete mixer services. The Mack F Series of Cab-Over Engine (COE) was introduced in 1962 and remained in production until 1979. The F series vehicles were available with a wide variety of Mack and vendor diesel

engines, single and tandem drive axle configurations and non-sleeper and sleeper cabs.

In the back of the UPS truck we have a video display showing clips showing the distribution system for UPS, FedEx and DHL. We also have a **Yale 4P Motorcycle**. Yale motorcycles were built from 1901 to 1915. The company originally started as the California Motor Company (producing California Motorcycles), then changed their name to Yale-California, and finally, to Yale. Considered a gentleman's machine, it had a stalwart reputation for reliability. The distinctive cylinder slung under the top frame member carried fuel while the large canister set astride the handlebar contained acetylene for powering the headlight. It was started by pedaling with the rear wheel up on its center stand, while the belt-drive propelled the bike. The 4P emblazoned on the gas tank along with the Yale logo stood for the rated horsepower of four hp, sufficient for a brisk but well-mannered 45 miles per hour.

Next we have a “**Life on the Road**” interactive display – an on-demand audio of truck drivers talking about their lives in the road. Feel free to return to this display after the formal tour is over. In our **mini-theater** we are showing various clips about different types of vehicles, bikes, trucks, etc.

Vehicle delivery services are not just limited to large trucks. Our next exhibit is a **1998 Huffy Superia Messenger Bicycle**. Bicycle messengers are a diverse group and they choose bikes that reflect their individuality. Direct drive track bikes are a common choice, but these can be difficult rides for a courier new to the job. Others choose road or mountain bikes that they customize to meet their needs.

Here you have the chance to **Drive a Mack!** You can climb into a **2006 Mack Granite Model Heavyduty Straight Truck** and, through auto-video, sample the sights and sounds of the road from the driver's vantage point. This exhibit has an interesting history. This cab and frame section was assembled at Mack's Macungie, PA plant. It was used by technicians at Mack's Engineering Development & Test Center to test production methods of truck designs that were updated in light of new diesel emissions regulations implemented in 2007. Afterwards the vehicle was rebuilt and outfitted for the driving simulation experience here at America on Wheels! The Granite model is used in construction and refuse collection.

At the bottom of the ramp, we have a **1911 Mack Junior Series** fitted with a box painted to advertise Arbogast & Bastian (also known as A & B Meats). For those of you not familiar with this area, the museum is located on the site that used to be occupied by the A&B Meats slaughterhouse and meat packing plant. The Mack Junior Series was the lighter of the two truck models designed and built by Mack Brothers Motor Car Co. Approximately 1300 Junior Series trucks were built from 1909 to 1916. Trucks in this decade were still mainly used for local transport, either for urban or farm applications. They were used to transport a wide variety of items including construction material, produce, dry goods, bulk liquids, furniture, etc. Roads generally were not paved. Railroads,

canals, and rivers were used for moving large quantities of material over longer distances.

*[Note to Docents – now moving to the left]*

As I am sure you have noted by now on the tour, a strong focus of the museum is devoted toward the history of the Mack Truck. Already established as a maker of horse-drawn wagons, the Mack brothers were approached in 1900 to build a sightseeing bus, which became the first Mack “truck.” At that time, the Mack brothers (John and William) were based in New York. However in 1905 Mack moved here to

Allentown and began producing their Junior and Senior (the big brother to the Junior) models. In this area we have an interactive (**A World Class Company**) which has audio excerpts from interviews of former Mack employees. Across from that interactive we have a display case containing models of various Mack trucks. On the other side of the case is various **Mack memorabilia**.

By the way, a number of volunteers here at America on Wheels are Mack retirees and, in fact, the Chairman of America on Wheels board of directors is Jack Curcio, retired CEO of Mack Trucks.

*[Note to Docents – you may want to mention that the Mack trucks on display here are on loan from the*

*Mack Museum here in Allentown and advise visitors that information on the Mack Museum is available*

*on the way out (vestibule) on the rack of other area attractions.]*

Next we have a **1927 Mack AC Model**. The AC model replaced the Senior Series. It was produced from 1916 to 1938 during which over 40,000 were produced. The AC became famous on the WW I battlefields and were named “Bull Dogs”. Mack Model AC trucks were used in a wide variety of demanding applications that required a powerful vehicle. Many were used in logging, construction, and petroleum industries. The Model AC continues to be extremely popular with antique truck collectors and enthusiasts.

*[Note to Docents – in case you are questioned in why the 1927 Mack AC and the 1918 Mack AC Fire Truck have the IM on the front instead of the Mack name (it is on the side) – In 1911, Saurer Motor Company joined Mack to form a holding company: International Motor Company (IMC). Saurer and Mack were still marketed under their separate names; in 1912 Hewitt Motor Co. joins IMC; in 1913, the Hewitt line of trucks was dropped; in 1919 Saurer line of trucks dropped – Mack is now sole line offered by IMC; in 1922 parent company changed from IMC to Mack Trucks, Inc; International Motors continued as the manufacturing subsidiary of Mack until 1936 – and you thought mergers, holding companies and name changes were a recent development in the automobile industry!]*

While the AC replaced the Senior Series, the AB model superseded the Junior Series (although there was an overlap of several years – production of the AB began in 1914 while Juniors were produced through 1916.) The AB Series was produced till 1936 and over 50,000 were built. Representing the AB series we have a **1922 Mack AB Model**. The AB's rugged design made it popular in many applications such as agriculture, the food industry, light construction and

municipal. In addition, many AB's were the platform for local and inter-city buses. This AB is equipped with a Mack built dump body. The hoist for the body is actually a chain-driven mechanical system. It is also equipped with an "all weather" cab; enclosed truck cabs were first making their appearance in 1922.

Next we have a **Maxidyne ENDT-675 Series Diesel Engine**. The Maxidyne series engines was introduced in 1966 and was a "constant horsepower" engine that produced from 206 to 237 horsepower between 1200 rpm and 2100 rpm, its governed maximum speed. The constant power reduced the need for complex 10, 14, or 15 speed transmissions. The Mack engine governor controlled power output to increase engine torque as rpm decreased. A new five-speed Maxitorque transmission was developed at the same time.

*[Note to Docents – in case you are asked - The AB and the AC were not the only models in the A series – other models were produced. In 1928 the new B series was introduced. During the 1930 and 1940's new series advancing through the alphabet continued. As was noted in the North gallery with Ford in the early days, Mack finally came to the point where it was necessary to repeat the alphabet. Thus the company celebrated its Golden Anniversary in 1950 with the introduction of a new A series truck. In 1953, the B series was again used.]*

The most famous and most recognized of the Mack B series is the B61 Model. It became the most popular over-the-highway, conventional, diesel powered truck in the USA in the 50's and 60's. This is a **1957 Mack Model B61T**. The B61 was used in a wide variety of tractor and straight truck applications, most frequently over-the-highway bulk and freight service. The B61's fresh, aerodynamic styling, more comfortable cab, and the new direct injection Mack END673 Thermodyne Diesel were ahead of competitive vehicles on that period. The END 673 provided excellent fuel economy, performance, and durability.

The **1958 Mack B753LS** was part of the B70 series that was in production from 1955 to 1966. The B70 series had a longer engine compartment to house the larger diesel engines demanded by mid-west and west-coast operators. The optional L model cab provided the larger interior space demanded by some western customers. This series trucks were used in demanding applications such as logging, mining, and construction as well as over-the-highway service pulling freight and bulk trailers. This truck is equipped with a 15 cubic yard dump body; however during its active life, it carried a water tank body. It was used in highway, airport, tunnel, and other construction projects in the Colorado and Wyoming areas.

Now taking a break for the moment in our theme of "Vehicles – at Work and at Play", we step back in time to look at how vehicle maintenance and repairs were done in the 1950's. Here we have a full size replica of **Guy's 1954 Garage**. It is modeled after an independent, full service garage that was equipped to do a wide range of services from fueling and minor maintenance to major repairs such as engine rebuilds. All tools and equipment in this garage are authentic to the time period.

In front of Guys Garage we have a **1929 Sunoco Gas Pump**, typical of what might have been in front of Guys garage, even in 1954. This pump was electric



and had a dial gauge showing from one to twenty gallons. This particular pump spent most of its life at the Hotel Trayler here in Allentown.

At the far end of the garage we have a typical vehicle of the period, a **1948 Chevrolet Fleetmaster Convertible**. Fleetmasters were Chevrolet's top-of-the-line vehicles for 1948, and the convertible model was the second-most expensive vehicle Chevy sold at the time – priced at around \$ 1,700. Chevrolet sold 675, 994 Fleetmasters from 1946-1948, enough to establish Chevrolet as the nation's best-selling car brand. It's no wonder that Chevrolet chose the Fleetmaster convertible in 1948 when offered the honor of supplying the pace car for the 42nd running of the famed Indianapolis 500.

*[Note to Docents – You may want to point out that a good photo op of the garage and the Fleetwood is from the platform in back of the Suburban and the Station Wagon (in the theater area).]*

However, even as good as the Fleetmaster was, it occasionally needed servicing. Here in Guy's garage, it is shown on a garage lift (from the time period). On the workbenches throughout the garage, components of a 1948 Chevy are shown in various states of assembly/disassembly – yes these are actually parts from a 1948 Chevy! In 1954 it was common for mechanics to be craftsmen who repaired assemblies in vehicles rather than simply replacing parts as is common today.

- Note the desk in the garage “office”. We have a vintage “**garage**” **cash register** with keys for the various automotive services. Also, you can't see the detail from here but the book opened in the desk is an actual service manual for the 1948 Chevy opened to a page describing engine repairs.

- Beginning on the workbench in front of the office desk (the workbench with the large, black toolbox) is a **disassembled carburetor**. Mechanics would disassemble the delicate assembly and look for any worn or dirty parts, cleans and repair any bad parts, re-assemble the unit, and then adjust it to function correctly.

- On the workbench in the center rear is a **disassembled cylinder head** to an engine. The valves (long, narrow things sitting in a row) have been removed and the surface has been re-machined on a **valve grinding machine** (red machine on the bench).

- Moving to the left (but still in the rear of the garage) we have a mechanic who is rebuilding the **block of an engine**. New bearings have been pored and a special purpose tool, known as a **line boring tool** has been mounted on the engine block. This tool allows the bearing to be aligned perfectly in a straight line so the crankshaft will run true.

- On the workbench in front of the engine block (closest to us) is a **disassembled transmission**.

Note the different gears that allow the transmission to operate at different speeds.

- On the workbench to the extreme left, electrical repairs are being made. A **starter** and a **generator** are disassembled and are mounted of **special equipment to test and repair** those assemblies,

□ In front of the workbenches is the **tire repair area**. It was common practice to dismount flat tires, repair them, and then re-install them, rather than simply discard them and replace with new.

□ Beyond the tire repair area, on the wall are a number of **hand tools** that would be found in a garage.

□ Finally, to the right, we see that the Fleetmaster is located on a **1940's vintage, four post lift**. This lift was used to raise the vehicle off the ground to make it easier to work on the lower part of the auto.

You may want to come back after the tour and take a closer look at the detail in this exhibit. It truly captures an interesting view of automotive history. For ease in viewing we have the left side door of the garage open so you can see the details of the workbenches better. While you are over there, take a look at the **automotive tools and parts** contained in the display case.

Now getting back to Vehicles – At Work and At Play, across from Guy's garage, we begin the transition from work to play.

We have a **1935 Chevrolet Suburban Carryall**. It didn't have cup holders, a CD player, air conditioning, a roof rack, or reclining seats. In fact, it didn't have an automatic transmission or any of the amenities that are taken for granted today, and 4 wheel drive was still 22 years in the future. But what it did have was seating for eight in an enclosed, steel body, a proper tailgate and it rode on a truck chassis. That makes it a sport utility vehicle no matter how you cut it, and it was the first of its breed. The Chevrolet model EB Suburban Carryall was introduced in mid-1935 and only 75 were built (only five are known to have survived). Today, the Suburban is the longest lived continuous automobile nameplate still in production. As can be seen in the rear of the Suburban, they often served as a work vehicle. In this case it is being used by a traveling vacuum cleaner salesman. The Suburban eventually evolved to be today's SUV, and thus we have begun the transition to vehicles at play!

Next to the Suburban, we have a **1957 Chevrolet 210 Station Wagon**. Thanks in part to a booming population and advances in steel bodywork, station wagons made the jump from simple business vehicles to comfy and popular family haulers in the 1950's. This particular model, the Chevrolet 210, was a very practical choice because it delivered tons of room, lots of chrome and could be fitted with luxury options like power window lifts and a Powerglide automatic transmission that was found in higher-priced models like the Bel Air and the Nomad.

Further illustrating the “at play” aspect, in front of the Station Wagon we have a three burner, **American Kampkook Stove** and a **Classic Child's Tricycle**. Also to the left of the car we have a **1947 Girl's Columbia Bicycle**. We now move to a more extreme form of “Vehicles – At Play”, Professional Race Vehicles. In this area we have four modern race vehicles.

□ **1974 Yamaha TA125A** - Carmakers in the 1960's knew race victories, from professional circuits to the gritty street racing scene, boosted their reputation and dealership sales. Yamaha was the first Japanese Motorcycle manufacturer to

catch on, producing a few affordable 250cc bikes in 1963 that weren't street-legal, but ready to race right out of the crate. They sold like hotcakes.

By 1973, the young company dwarfed Suzuki and gained on Honda's sales lead. Yamaha decided their "hot up kits" designed to convert street bikes into 125cc racers weren't enough. The TA125A, Yamaha's first production bike for the light and nimble 125cc racing class, was introduced in 1974 for amount \$ 750. An interesting fact about this bike is that Gina Bovaid of Maxatawny, PA purchased this bike and piloted it to the honor of being the first woman to race in the premier motorcycle world championship Grand Prix. She was also the first woman to race in the Daytona 200.

□ **1986 Penske PC-15** – Penske Racing, with 14 Indianapolis 500 victories and 124 victories in the CART and IRL leagues as of 2006, is considered by all to be one of the royal families of open-wheel racing. Penske's early successes brought the resources to build their own chassis and, from the mid 1970's the floor of their Reading PA facility, saw the birth of many designs that would dominate the field, including the PC-6 that would win all but 2 races in 1979 and earn a pole position in every race. This particular chassis, the PC-15, was made in response to competitive new chassis being supplied to teams from companies like March and Lola. Legendary drive Al Unser piloted the PC-15 in 1986 to qualify for his 7<sup>th</sup> starting position at Phoenix and the 6<sup>th</sup> starting position in the Indy 500 with a 211.530 mph run.

□ **2005 NASCAR Dodge Charger** - from Penske Racing – Before Ryan Newman was written into the history books for his 2006 Daytona 500 win, this machine helped cement his reputation as a brilliant up-and-comer in the world of NASCAR. The car, built for track events (½ mile to 1 ½ mile tracks) and driven from 2005 to 2006, helped Newman establish himself as the 11<sup>th</sup> best finisher in racing against the clock for starting position (pole) in NASCA races. Further building the reputation of 2002's NASCAR Raybestos Rookie of the Year, this car was piloted to a 3<sup>rd</sup> place finish at Richmond International Speedway in 2005 and a 6<sup>th</sup> place finish in 2006.

Dodge proudly notes the car retains design clues of the baby blue no. 43 STP Dodge Charger –  
the chariot of Richard Petty.

□ **1967 McLaren M1C** - In 1967 M1C was Bruce McLaren's third design in his tragically short life as a brilliant designer, engineer, inventor and race driver. McLaren's aerodynamic progress is seen in the new separate spoiler, adjustable so down force on the car's rear could be changed for different conditions. Further advancements made to M1C the last design with a body skin attached to the cars frame as two separate parts. Trojan builds 24 M1Cs for customers hankering for glory in the Canadian-American Challanenge Cup Series (Can-Am) which ran from 1966 to 1974. M1C's finished 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> in the series' first race of 1067. First and second place belonged to McLaren and teammate Denny Hulme in their new M6Aa.

*[Note to Docents - The Can-Am series in the late 60's was a series with many innovations, including the flipper wing high above the Chaparral 2-E with the high*

*raised flipper wing for downforce in 1966 (until moveable wings were banned) and the 2-J which added two 45hp snowmobile engines to the 700 hp Chevy engine. These smaller engines powered two 17-inch fans which blew air out the back, sucking the car down to the road because of the flexible Lexan skirts on the sides of the car. The 2-J only ran in 1970 until competitor's complaints caused these moveable aerodynamic aids to also be banned (there was the extra problem of stones being thrown out the rear by the fans into the faces of the following cars).]*

Across from the Race cars we have some two wheel vehicles that were used by pleasure and/or racing.

□ **1910 Flying Merkel Motorcycle** – In 1900 Joseph Merkel operated his own business manufacturing bicycles in Milwaukee, Wisconsin. He mounted small gasoline engines into his frames. The Merkel Motorcycle was born. In that same year, Merkel was credited with manufacturing the first gasoline power vehicle, a tricycle, to be built in the state of Wisconsin – three years before the Harley and Davidson boys began tinkering with their own famous project. In 1908 Merkel merged with the Light Manufacturing Co of Pottstown, PA. By 1909, Merkels became known as Flying Merkels due to their racing successes. This 1910 model has a single cylinder engine mounted in a frame of a loop design, which lowered the center of gravity of the engine, improving the handling of the motorcycle. Productions of the Merkels ended during World War I due to unavailability of German made Hess-Bright ball Bearings (used throughout the engine).

□ **1914 Excelsior Motorcycle** - In mid 1911, bicycle magnate Ignaz Schwinn purchased the manufacturing rights to the Excelsior Auto-Cycle. Under the new name of Excelsior Motor Manufacturing and Supply Company, Excelsior was to become one of the Big Three of American motorcycle industry. This 1914 model has a single cylinder motor.

□ **1983 Veloce Time Trial Track Bicycle** - John Stinsmen built this track bike for maximum speed in races against the clock. The lightweight frame includes a downward slanted top tube, smaller front wheel, bladed spokes, and rear disk, all designed to maximize aerodynamics and enable the rider to cut through the wind. Top speeds for time trial bikes on the track are in excess of 40 miles per hour in sprint races.

□ **1912 Reading Standard Track Bicycle** - By the early 20<sup>th</sup> century, the standard for track racing were in place. Track bikes were as light as possible, used a fixed gear, and had no breaks. Riders competed on racetracks, known as velodromes, typically a wooden oval with steeply banked turns at the corners. This bike was manufactured by the Reading Standard Manufacturing Company of Reading PA.

□ **1912 Indian Motorcycle** – Indian was the largest producers of motorcycles (Indian preferred the term “motorcycle”) during this time period – a position they held till World War I when all their production went to the army (after the war they fell to number 2 behind Harley-Davidson). This “Regular Model 61” twin cylinder, 7 horsepower, 60.92 cu in (998 cc) included ported valves which would spew oil and flames out the openings. The front tire is from the time this bike raced on dirt

tracks, but the Goodyear Blue Streak Board Track Tire is possibly the only remaining one in existence in the US. This bike raced much of its life on the banked board tracks which were briefly popular in the racing world, made of 2X4 laid so that the 2" side was the surface of the track. Maintenance was very expensive and labor intensive on these tracks and many suffered from holes forming where the wood rotted, and others fell victim to fires. The first board track opened at the Los Angeles Coliseum Motordome near Playa Del Rey, on April 8, 1910. Based on and utilizing the same technology as the French velodromes used for bicycle races, the track and others like it were created with 2-inch x 4-inch boards, and banked up to 45. Around a half dozen tracks up to two miles (3 km) long had opened by 1915. By 1931 there were 24 operating board tracks, including tracks in Beverly Hills, CA, Atlantic City, NJ, Altoona, PA, and Brooklyn, NY.

Next we move to "strange" forms of vehicle racing.

□ **1984 MTD Racing Lawn Mower** – In 1983 some Englishmen realized racing was too expensive for the average person to afford... but lawnmowers aren't. The British Lawn Mower Racing Association was formed, and on April Fools' Day in 1992, the fever came to America. U. S. Lawn Mower Racing Association members engineer and race chariots like Lawn Ranger, Sodzilla, Turfinator and this champion racing lawn mower. Competing since 1999, one of this mower's strength is its age – older lawnmowers use a mechanical transmission that's easily modified for speed.

Finally we have a display of different type of wheels and a display board telling "American Wheels – by the Number."

#### Reference Information

1977 Mack F785T UPS Cab and Trailer

□ Number Produced: 59,229  
□ Years of Production: 1962 to 1979  
□ Engine: Mack ETZ 675 ESI Six Cylinder Maxidyne Diesel; displacement 672 cu in; Bore and Stroke 4 7/8" X 6";Horsepower 237 hp; torque 906 lb ft @ 1200 rpm; Rated Speed 1800 rpm

□ Technical: Transmission Mack TRL1076 Triple Counter Shaft; Speeds 5 forward, 1 reverse;

Rear Axle Rockwell R170C; Ratio 3.70

□ Top Speed: 67 mph (governed)  
□ Dimensions: Vehicle Weight Rating 31,700 lbs (Tractor Only)  
□ Price: NA  
□ Built by: Mack Trucks, Inc.  
□ Interesting facts: Cab over Engine, Used by UPS mainly for terminal to terminal runs.

Yale 4P Motorcycle

□ Number Produced: NA  
□ Years of Production: 1901 - 1915  
□ Engine: 4 horsepower

- ☐ Top Speed: 45 mph
- ☐ Built by: Consolidated Manufacturing Company of Toledo, OH
- ☐ Interesting facts: The company originally stated as the California Motor Company (producing California Motorcycles), then changed their name to Yale-California, and finally, to Yale. The distinctive cylinder slung under the top frame member carried fuel while the large canister set astride the handlebar contained acetylene for powering the headlight. It was started by pedaling with the rear wheel up on its centerstand, while the belt-drive propelled the bike.

- ☐ 1998 Huffy Superia Messenger Bicycle
- ☐ Number Produced: NA
- ☐ Years of Production: NA
- ☐ Engine: Human Powered
- ☐ Dimensions: length 67 inch; height 40 inch
- ☐ Price: NA
- ☐ Built by: Huffy Bicycle Company
- ☐ Interesting facts: Used by bicycle messengers

#### 2006 Mack Granite Model Heavy-duty Straight Truck

- ☐ Number Produced: NA
- ☐ Years of Production: 2001 to ??
- ☐ Dimensions: length 142 inch ;height 114 inch;
- ☐ Built by: Mack Trucks, Inc. at Macungie, PA Plant
- ☐ Interesting facts: Originally built for use by technicians at Mack's Engineering Development & Test Center to test production methods for truck designs that were updated in light of new diesel emissions regulations implemented in 2007. Afterwards the vehicle was rebuilt and outfitted for the driving simulation here at America on Wheels.

#### 1911 Mack Junior Series (A & B Meats)

- ☐ Number Produced: NA
- ☐ Years of Production: 1914 to 1936
- ☐ Engine: Mack Junior Four Cylinder Gasoline; Displacement 350 Cu in; Bore and Stroke 4 1/2"

X 5 1/2"; Horsepower 32 hp

- ☐ Technical: Transmission Mack Mechanical; Speeds 3 Forward, 1 Reverse; Rear Axle Mack

Chain Drive; Brakes Mechanical, rear axle only

- ☐ Top Speed: 16 mph
- ☐ Dimensions: wheelbase 164 inch; vehicle weight rating 2 tons
- ☐ Price: NA
- ☐ Built by: Mack Trucks
- ☐ Interesting facts: Wood spoke wheels; Front tires 36' X 5" solid rubber, Rear tires Dual 36" X 5" solid rubber; Acetylene gas Headlamps; Hand crank starting

#### 1927 Mack AC Model

- ☐ Number Produced : 40,299
- ☐ Years of Production: 1916 - 1938

- Engine: Mack AC four cylinder Cast pairs gasoline. Displacement 471 cu in, Bore and Stroke 5" X 6"; 77 hp; Torque 320 lb ft; Rated Speed 1800 rpm
- Technical: Transmission – Mack AC with integral differential and jackshaft, Speeds 4 forward, 1 reverse; Rear Axle Mack AC Chain Drive; Ratio 8.31 Overall
- Top Speed: 20 to 25.8 mph (governed)
- Dimensions: Vehicle Weight Rating 10,000 pounds
- Built by: Mack Trucks
- Interesting facts: Acetylene Gas Headlamps, Wood Spoke Wheels, Front tires 36" X 7" solid rubber, rear tires 40" X 14" solid rubber; Hand Crank Starting  
1922 Mack AB Model
- Number Produced: 51,613
- Years of Production: 1914 - 1936
- Engine: Mack AB 4 Cylinder Cast Pairs Gasoline, Displacement 251 cu in, Bore and Stroke 4" X 5", Horsepower 35 hp
- Technical: Mack AB transmission, Speeds 4 forward, 1 reverse speed, worm, Rear Axle Mack Chain Drive; Cast Steel Spoke Wheels, solid rubber tires – front 36"X5", rear 36"X 12"
- Top Speed: 19 mph (governed)
- Dimensions: Vehicle Weight Rating 2 ½ tons.
- Built by: Mack Trucks
- Acetylene Headlamps, Kerosene Side Lamps; Chain drive hoist on dump body, "all-weather" cab, Hand Crank Starting  
Maxidyne ENDT-675 Series Diesel Engine
- Number Produced: NA
- Years of Production: 1966 - ??
- Horsepower: 237 hp
- Torque: 900 lb ft @ 1200 rpm
- Speed: 2100 rpm
- Built by: Mack Trucks, Inc
- Interesting facts: A "constant horsepower" engine that produced from 206 to 237 horsepower between 1200 rpm and 2100 rpm, its governed maximum speed. The constant power reduced the need for complex 10, 14, or 15 speed transmissions. The Mack engine governor controlled power output to increase engine torque as rpm decreased.  
1957 Mack Model B61T
- Number Produced: 126,377
- Years of Production: 1953 to 1966
- Engine: Mack END673 Thermodyne Diesel; Displacement 672 cu in; Bore and Stroke 4 7/8" X 6"; Horsepower 170 hp; Torque 480 lb ft @ 1200 rpm; Rated Speed 2100 rpm
- Technical: Transmission Mack TRD720; Speeds 9 forward, 2 reverse; Rear Axel Mack RAD 512; Ratio 6.20
- Top Speed: 55 mph (governed)
- Dimensions: Vehicle Weight Rating 30,500 pounds (tractor only)
- Price: NA
- Built by: Mack Trucks, Inc.

❑ Interesting facts: Most popular over-the-highway, conventional, diesel-powered truck in the USA in the 50's and 60's

1958 Mack B753LS

❑ Number Produced: (B70 Series) 476

❑ Years of Production: (B70 Series) 1955 to 1976

❑ Engine: Mack ENDLT673 Six Cylinder Thermodyne Diesel; Displacement 672 cu in; Bore and Stroke 4 7/8" X 6"; Horsepower 205 hp; Torque 560 lb ft @ 1400-1500 rpm; Rated Speed 2100 rpm

❑ Technical: Transmission Mack TRTL72 Triplex Two Lever, Single Counter Shaft; Speeds 15 (5 X 3) forward, 3 reverse; Bogie Mack SWDL56 Camelback Spring; Ratio 5.08

❑ Top Speed: 58 mph (governed)

❑ Dimensions: Vehicle Weight Rating 43,500 pounds

❑ Price: NA

❑ Built by: Mack Trucks, Inc.

❑ Interesting facts: 15 cubic yard Dump body; For Mid-west and West Coast Operators who wanted larger interior space; originally equipped with a water tank body; This truck was used in highway, airport, tunnel, and other construction projects I Colorado and Wyoming areas.

1948 Chevrolet Fleetmaster Convertible

❑ Number Produced: 20,471 2-dr Conv Cpe in 1948

❑ Years Produced: 1946 - 1948

❑ Engine: 216 cu in "Stovebolt" in-line six cylinder; horsepower 90 hp; Displacement 216.5 cu

in; Bore and Stroke 3 1/2" X 3 3/4"; Compression Ratio 6.5:1

❑ Technical: Transmission three speed Synchromesh with helical gears and manually operated steering column controls; Box girder frame; Four wheel hydraulic brakes with 11 inch drums; Rear axle ratio 4.11:1

❑ Dimensions: wheelbase 207 1/2inch; weight 3340 pounds

❑ Price: \$ 1,750

❑ Built by: General Motors

1935 Chevrolet Suburban Carryall

❑ Number Produced: 75 (in 1935 – introduced midyear)

❑ Years of Production: 1935 - Present

❑ Engine: In-line OHV 6 cylinder, cast iron block and head; horsepower 68.5 hp @ 3200 rpm; Displacement 206.8 cu in; Bore and Stroke 3 5/16" X 4"; Compression ratio 5.45:1

❑ Technical: Transmission 3 speed manual syncromesh; Brakes 4 wheel mechanical cable

operated drums; 18 gal fuel capacity; Carburetor Carter 1 barrel; Wire Spoke Wheels

❑ Dimensions: wheelbase 112.0 inch; length 186 inch ; width 68 inch ; height 80 inch

❑ Price: \$ 680

❑ Built by: General Motors



❑ Interesting facts: First Generation SUV; Suburban is the longest lived continuous automobile nameplate still in production.

#### 1957 Chevrolet 210 Station Wagon

❑ Number Produced: 66,000 210 Station Wagons in 1957

❑ Years of Production: 1955-1957

❑ Engine: 265 cu in small block V8; horsepower 160 hp; Bore and Stroke 3 3/4" X 3"; Compression ratio 8.0:1

❑ Technical: Transmission Powerglide 2 speed automatic

❑ Dimensions: wheelbase 115 inch; length 200 inch; weight 3566 pounds

❑ Price: \$ 2,130

❑ Built by: General Motors

#### 1974 Yamaha TA125A

❑ Engine: 125 cc two-stroke; horsepower 24 hp

❑ Technical: Transmission five speed; originally front drum brakes, modified to front disk brakes

❑ Dimensions: weight 78 pounds

❑ Price: around \$ 750

❑ Built by: Yamaha Motor Corporation

#### 1986 Penske PC-15

❑ Engine: Chevy Turbo V8

❑ Designer: Alan Jenkins

❑ Dimensions: length 15' 6"; width 6' 8"; height 3' 1"

❑ Built by: Penske Racing

#### 2005 NASCAR Dodge Charger

❑ Engine: 358 cu in Dodge; Horsepower 800 hp; 4 barrel carburetor; Compression ratio 12.0:1

❑ Technical: Transmission PCI 4 speed

❑ Top Speed: 200 mph

❑ Dimensions: length 202 inch ; width 72 inch ; height 51 inch; weight 5,400 pounds

❑ Built by: Penske Racing

#### 1967 McLaren M1C

❑ Engine: 355 cu in Chevrolet small block with 4-481DA Weber carburetion

❑ Technical: Transmission Hewland 4 speed; chassis large tube space frame with bonded and riveted panels and bulkhead; body fiberglass

❑ Dimensions: wheelbase 90.5 inch; length 150 inch ; width 70 inch ; height 41 inch

❑ Built by: McLaren Automotive

#### 1910 Flying Merkel Motorcycle

❑ Number Produced: NA

❑ Years of Production: 1901 - 1917

❑ Engine: Single cylinder; displacement 30.43 cu in; horsepower 4 hp

❑ Technical: Transmission single speed belt drive

❑ Top Speed: 50 mph

- ❑ Price: \$ 250
  - ❑ Built by: Merkel-Light Manufacturing Co of Pottstown, PA
  - ❑ Interesting facts: Successful in the racing world, production ended during World War I due to unavailability of German made Hess-Bright bearings that were used throughout the engine.
- 1914 Excelsior Motorcycle
- ❑ Number Produced: NA
  - ❑ Years of Production: 1907 – 1924
  - ❑ Engine: Single cylinder; Displacement 30.50 cu in (500cc); Bore and Stroke 3 21/64" X 3 1/2"; horsepower 6 hp
  - ❑ Technical: Transmission Excelsior-Eclipse multiple disc, ball bearing motor shaft type, operated through the left hand twist grip; Suspension was achieved by a Vanadium steel leaf spring fork on the front and a sprung saddle for the rear; Frame was a stress member type using the motor cases as part of the triangulation.
  - ❑ Price: \$ 200
  - ❑ Built by: Excelsior Motor Manufacturing and Supply Company
  - ❑ Interesting Facts: Excelsior Co. was formed by Ignatz Schwinn, the bicycle builder; Excelsior was one of the pre-World War I "Big 3" motorcycle companies (Indian – No.1, Harley- Davidson – No. 2); although there were over 100 motorcycle companies they divided into two tiers – the "big 3" and the rest.
- 1983 Veloce Time Trial Track Bicycle
- ❑ Engine: human powered
  - ❑ Top Speed: 40 mph
  - ❑ Dimensions: length 65 inch ; width 18 inch ; height 36 inch
  - ❑ Price: NA
  - ❑ Built by: Stinsmen Racing
- 1912 Reading Standard Track Bicycle
- ❑ Engine: Human powered
  - ❑ Dimensions: length 68" inch ; width 23" inch ; height 35" inch
  - ❑ Built by: Reading Standard Manufacturing Co. of Reading PA
- 1912 Indian Motorcycle
- ❑ Number Produced: NA
  - ❑ Years of Production: 1901 - 1953
  - ❑ Engine: twin cylinder, 7 horsepower, displacement 60.92 cu in (998 cc)
  - ❑ Built by: Hardee Manufacturing Co.
  - ❑ Interesting facts: Indian was the number one motorcycles in the pre-World War period. They fell to number 2 (behind Harley-Davidson) after the war after having sold their entire production during the war to the Army – they never regained the number 1 spot.
- 2007 Rocket Barstool Racer
- ❑ Engine: Tecumseh Power Sport racing motor; horsepower 6 hp
  - ❑ Dimensions: length 56 inch ; width 40 inch ; height 39 inch; weight 160 pounds
  - ❑ Built by: Rocked Manufacturing Inc.
- 1984 MTD Racing Lawn Mower

- Engine: Briggs and Stratton 16 horsepower s, twin cylinder, modified to deliver 40+ hp

- Technical: Transmission 3 speed manual lawnmower

- Dimensions: width 38"; weight 350 pounds

- Built by: MTD

Interactive displays and videos:

- Life on the Road Interactive – On-demand audio of truck drivers talking about their lives on the road.

- Drive a Mack Interactive – Visitors can climb into a Mack Granite cab and, through audio/visual, sample the sights and sound of the road from this vantage point.

- A world Class Company Interactive – On-demand audio excerpts from interviews of former Mack employees.

- What's my Job Interactive – Game for children where they can match Mack trucks to household items that perform similar functions (trashcan – garbage truck, snow shovel – snowplow, etc.)

- What does This Thing Do Interactive – An array of auto tools displayed along with hidden answers to "What am I?, and What do I do?"

- What Makes Them Go Interactive – Touch screen explaining various aspects of auto operation

*[Docent note – this display is currently non-functional]*

- Memories in Motion Interactive – Visitors post responses to questions displayed on fill-in cards.

- Which Wheels for You Interactive – Visitors respond to questions about their personal preference by turning a series of knobs. They then pull a "result" lever, which indicates what type of vehicle they are most naturally suited to. It's meant to be a conversation starter and humorous reflection, not a scientific result.

- Wayward Wheels Interactive – Visitors examine an array of actual tires and then match the tires to photos of the vehicles the tires are used on. Clues to the matches are provided on the flip pages that conceal the answers. *[Note to Docents - It can be fun, especially with adults, to start with the last panel about number of them made each years...most adults don't notice the Lego wheels and think that is just part of the graphics...another good conversation starter.]*

- Rapid Delivery Video

- Mini Theater Video *[Note to Docents - The Art Cars video is one that many non-gearheads find very entertaining.]*

- Macks in the Military Video *[Note to Docents - This is really more about the Lincoln Highway, and how Dwight Eisenhower saw a need for the Interstates, especially after seeing Hitler's Autobahn.]*

- Macks Build a Nation Video

- Need for Speed Video

## North Gallery

This gallery is dedicated to the evolving technology of motorized transportation. As the graphic on the entrance wall says, “The car of the future – A question for Yesterday, Today, and Tomorrow.” Upon entering the gallery (bearing to the left as you enter), you will see what some claim is the first American automobile, an **1891 Nadig** automobile (center area).

There is a lot of confusion and disagreement among historians, and a lack of good records to substantiate the claim of the “first auto” but the Nadig is certainly one of the first (although he failed at patent his invention; one of the facts that help to confuse the issue of who was first). And the Nadig was built right here in Allentown, three blocks from here, by Henry and Philip Nadig! It had a top speed of 15 miles per hour. Unfortunately this auto has had a rough life. After touring around on the streets of Allentown, it was displayed in New York's first auto show in 1900. It was still running in 1921, when a fire at the Nadig plant damaged the car's body. It was repaired and returned to the spotlight in 1930 at the Central Autorama in Allentown, then vanished. It was rediscovered in a garage south of Allentown and was purchased from Henry Nadig's grandson, Stanton.

Unfortunately, following that, it was stored in a building whose roof leaked and the body has given way to the elements. However you can use your imagination to visualize this new motorized contraption, motoring its way up and down the streets in Allentown competing for space with all the horse drawn vehicles.

*[Note to Docents – In case you get questions – it is generally accepted that the automobile was invented by Karl Benz and Gottlieb Daimler, of Germany in 1885. The first American automobile claim is disputed between Henry Nadig, Charles Lambert, the Duryea brothers, George Selden and others.]*

Returning for the moment to the 1890's, horse-drawn vehicles were the primary mode of transportation.

- **1885 High Wheeler Bike** – The large front wheel enables higher speeds (limited by the inside leg measurement of the rider). They were fast but unsafe. The rider was high up in the air and traveling at a great speed. If he hit a bad spot in the road he could easily be thrown over the front wheel and be seriously injured (two broken wrists were common, in attempts to break a fall) or even killed. "Taking a header", which was not at all uncommon, was no laughing matter.

The rider's legs were often caught underneath the handlebars, so falling free of the machine was often not possible. During this period, several manufacturing innovations were made (such as the assembly line) which were later adopted by the automotive industry. High-wheeler bikes were largely replaced in the 1890's by "safety bicycles" - They featured a steerable front wheel that had significant caster, equally sized wheels and a chain drive to the rear wheel.

Typical of vehicles during this period was the **1890 Studebaker Carriage**. In the early 19<sup>th</sup> century, Henry Studebaker was a farmer and blacksmith in Gettysburg, PA and he built wagons. Henry's sons, Henry Jr. and Clement set up shop in South Bend, IN in 1852 and continued to build wagons and carriages, developing a worldwide reputation. By 1887, sales surpassed \$2 million. Studebaker Brothers Manufacturing Company went on to become a top-ranked automotive producer (until 1966).

From these "horse-drawn" carriages, "horse-less" carriages evolved. As you look at the carriage you will note, similarities to the early autos such as the spoked wheels and the springs. A pioneer in the early auto industry was R. E Olds. In 1897, he formed Michigan's first motorcar production company, the Olds Motor Vehicle Company. The first Oldsmobile buggies had a one cylinder engine, two-speed planetary transmission, and tiller steering and in 1901 evolved into the famed "Curved Dash Oldsmobile".

Also in the 1890's, in Michigan, a young inventor by the name of Henry Ford was developing motorized autos. In 1896, he had developed his first vehicle called a quadricycle. Note, while it is commonly believed that Henry Ford invented the automobile, he did NOT. As we just saw, Henry Nadig, as well as a number of others, built automobiles several years before Ford did. In 1899 Ford formed the Detroit Automobile Company to build autos. However, Henry lost the company in 1902. The Detroit Automobile Company went on to become the Cadillac Automobile Company. In 1903, Henry Ford formed a new company, the Ford Motor Company. One of the first vehicles produced by the company was a **1903 Ford Model A**.

The model A we have here was owned by Mr. Shoemaker, the owner of Shoemaker's Drug Store here in Allentown and was the first automobile licensed in Allentown. It is a two-seater runabout, had a top speed of 30 mph (*docent note – sign stating 45 mph is in error*) and cost \$750. 1700 Model A's were built in 1903 and 1904.

*[Note to Docents – Ford produced two different vintages of “Model A”. Beginning in 1903 with the Model A, he continued to develop new models and named them the Model B, Model C, etc. He continued this naming system – although some letters never came into production – till he got to the Model T. This series was built from 1908 through 1927. He then decided to completely revamp the design and decided to call the model series beginning in 1928, “Model A” These were build till 1932 after which Ford began making annual model changes and dropped the letter identification naming system (however there was a second Model B only in 1932.)]*

The evolution of the automobile continued. In 1908 Henry Ford produced the first of over fifteen million Model T's. The Model T continued to be produce through 1927. There were more model T's sold than any other model car except for the Volkswagen Beetle. Ford's vision for the Model T was to produce a car that the average individual could afford. Many historians refer to the Model T as the automobile that put “America on Wheels”. 1914 marked the first year that the Model T's were produced on the moving assembly line, an innovation that allowed Ford to significantly lower the cost. Another change for 1914 was that auto were available only again in Black. Again this was a cost saving step that went along with the development of the assembly line.

The trend to motorize vehicles was not only affecting carriages intended to carry passengers. It was affecting wagons also. In the early 1900's, the Brockway family, wagon builders in Homer NY, realized that the future was not in horse drawn vehicles but rather in self-propelled vehicles. George Brockway built this **1910 Brockway Motor Wagon**.

It is one of the first motorized wagons produced by the Brockway Motor Truck Company. It was intended to be used as a farm runabout and had high wheels to allow the vehicle to traverse muddy, rutted roads common in those days. The skinny wheels could penetrate mud and snow to contact underlying hard surfaces. It has a three cylinder, 16 horsepower gasoline engine and a chain drive. In 1956 Brockway was purchased by Mack Trucks of Allentown. Today there is much debate about what form of power should be used by automobiles. This is NOT a new concept! In fact, in the early days of the automobile, it was not clear that the gas engine was the preferred form of power. Electricity had recently come into common use and auto companies were actively pursuing its use. The next several vehicles illustrate the early development of electric vehicles.

One of the most elegant of the electric vehicles was produced by the Detroit Electric Car Company. This **1922 Detroit Electric** has a top speed of 20 MPH and a range of 80 miles on a charge. Vehicles like this one were particularly popular with physicians and women who wanted reliable performance without the stress of hand-cranked starts. Famous Detroit Electric customers included Thomas Edison, John D Rockefeller and Clara Ford (wife of Henry Ford). Detroit Electric vehicles were produced until the mid 1930's. Of course, electric vehicles required charging of the batteries.

This **1909 GE Electric Car Charger** is typical of the equipment needed to accommodate this charging. This arc rectifier from General Electric

used a mercury bulb to convert AC (Alternating Current – commonly household electricity) to DC (Direct Current) – battery type current) for charging cars. One of the drawback then, as well as now, to electric vehicles was the access to charging stations while traveling away from home and the time needed to recharge the batteries (as well as the weight of the batteries themselves). Electric street cars were common during the 1890's. While many cities had overhead wiring to supply power to streetcars, some manufactures built battery-operated streetcars. Morris and Salome of Philadelphia was one of these companies. They began building battery powered Hansom cabs (taxicabs of the day).

This is a **1922 Detroit Electric**. These were thought to be one of the more elegant electric cars of the era, with the wrap around windshield and spacious interior. Mostly, people who were more well off, like doctors, purchased these. They were much easier to handle than a gasoline powered car, and women felt comfortable with them as well. The Detroit Electric was known to have a range of 80 miles per charge, but supposedly, someone squeezed 211.3 miles out of one! These cars were built until the mid-1930s.

We have an **1895 Electro bat IV** built by Morris and Salome. This is an improved version of those early Hansom cabs and features air-filled tires and a much lower weight than the early models. It is powered by two 75 pound electric motors powered by a 350 pound battery. It had a top speed of 20 MPH and a range of 25 miles.

Electricity was not the only alternative power source. Steam was also used as a power source. This is a **1909 Stanley Steamer Model R**. Stanley Steamers were famous for their power and speed. In 1899 a Stanley was the first car to climb Mt. Washington and in 1906 a Stanley Set a world speed record – 127.7 mph. The engine developed 20 HP from a 23 inch boiler located under the hood. The car had a 16 gallon gas tank which would take the car a distance of 125 to 175 miles before refueling was needed; however you could only travel 40 to 50 miles until you needed to refill the 30 gallon water tank!

But Steam cars were not actually an alternative fuel car – they used gas or kerosene to heat the boiler! The downfall of steam cars began in the late 1901's as the internal combustion engine became more efficient, powerful and easier to start. On the back of the Stanley is "Mother-in-Law seat. These seats were often found on pre-World War I cars. These seats were a one passenger version of "rumble seats". Rumble seats were an upholstered exterior seat which hinges or otherwise opens out from the rear deck of a pre-World War II automobile.

As may have been noted earlier, while through most of the 20<sup>th</sup> century, Michigan has been known as the center of automotive activities, significant early development took place right here in Pennsylvania.

This display shows **Early Automobiles – Made in Pennsylvania**. From the beginning of the industry until 1943 there were 85 companies (that built six or more vehicles).

Feel free to return to this display after the formal tour ends to learn more about the local influence that companies had on the development of the automotive industry.

*[Note to Docents – this display will only be present for the 100<sup>th</sup> anniversary.]*

The early automobile culture was dominated by males. Females often were relegated to the back seat. However there were notable exceptions. This year (2009) is the 100<sup>th</sup> anniversary of **Alice Ramsey** became the first woman to drive cross country (from New York, NY to San Francisco, CA). She accomplished this feat in a 1909 Maxwell Model DA Touring car. She was 22 years old at the time. The trip took 59 days, covered 3,800 miles and began on June 9, 1909. *[Docents – additional info: The Maxwell was Dark Green with a 30 HP, 4 cylinder engine. It was donated for the event by the Maxwell-Brisco (later was merged into Chrysler) for publicity purposes. Maxwell sales were 9000 cars in 1909 and 20,000 the*

*next year so it must have worked! Passengers with Alice were: Nettie Powell, Margaret Atwood, and Hermine Jahns. Alice died in 1983.]* You can read about the 2009 re-enactment of this drive at

<http://aliceramsey.org/> - also, Alice Ramsey's Grand Adventure (Paperback) by Don Brown is a good children's book about this event.

Now, returning to the evaluation of the electric vehicles. The interest in electric vehicles declined as gasoline based internal combustion engines became more efficient and gasoline prices stayed low. During the 1930's it became clear that gas engines had won the battle. However in 1973 the world situation changes and the first of several "oil crisis" developed. This sparked a renewed interest in "alternative fuel" vehicles.

One of the first of the "next generation" electric cars was the Citicar built by Sebring Vanguard. This **1976 CitiCar** uses a 36 v DC electric motor powered by six 6 volt batteries and weights 1250 lbs. It has a top speed of 38 mph and a range of 50 miles – not exactly impressive specifications, but the beginning of the next generation work on electric vehicles.

The next major advancement in electric vehicle technology was a development project by General Motors which lead to the development of the EV1 vehicle. On loan from the Henry Ford Museum (correct name is: "The Henry Ford") of Dearborn Michigan is one of several remaining EV1 vehicles.

This is a **1996 GM EV1**. 1,117 EV1's were produced from 1996 through 1999. It was the first mass produced electric vehicle of the modern era from a major automaker and the first GM car designed to be an electric vehicle from the outset. It was to be the first GM car in history to wear a "General Motors" nameplate instead of one of GM's marques. The EV1 was a subcompact car, with a 2-door coupe body style. The car's 3-phase AC induction electric motor produced 130 horsepower. The EV1 model had a range of 100 miles. The EV1's were not offered for sale; they were only available for lease. In 2000 GM decided to end the EV1 program and in 2003 recalled all the cars. All but a few, which were donated to museums, were destroyed. Fortunately, General Motors kept the lead engineers from this project, and hired several from the companies



that helped develop the EV1 to continue the research into the modern electric car, and many of them have been instrumental in the development of the Chevrolet Volt.

Behind the EV1 one of the **Home EV1 Charging Stations**. Quite a change from the 1909 Charging station we saw earlier! This 22- volt home charger could recharge the EV1 batteries in 2 -3 hours while a portable charger (110 Volt) that was available took 15 hours to recharge the batteries. Remaining challenges in the electric vehicle innovation path are to increase the range, reduce battery weight, and reduce charging time. In an attempt to bridge this technological gap, another “alternative fuel” strategy is “hybrid” vehicles. A hybrid vehicle is a vehicle that uses two or more distinct power sources to move the vehicle. Most commonly this refers to hybrid electric vehicles which combine an internal combustion engine and one or more electric motors. Hybrids combine the fuel savings associated with electric power with the distance advantage of internal combustion engines. By 1995, advances in technology and lowered battery costs and higher capacity reached the tipping point and several manufactures (Toyota, Ford, GM, etc.) began introducing hybrid vehicles.

This **2010 Toyota Prius V Model Hybrid** (3<sup>rd</sup> generation Prius) is an example of a hybrid vehicle. It includes a 1.8 Liter, 4 cylinder gasoline engine and an 80 horsepower (60kw) electric motor. It has a combined mileage rating of 50 miles per gallon. It uses an electronically controlled, continuously variable transmission. An interesting feature on this auto is its solar roof panel which powers a ventilation fan, providing sufficient air flow to cool the cabin to near outside temperatures. The base price is \$ 27,270 (\$ 33,193 with options). This auto is equipped with an optional parking assist feature and Bluetooth/satellite radio

*[Note to Docents – Sign on Prius is out of date – it says 2008 Toyota Prius]*

Another alternative under development is Hydrogen based vehicles. These vehicles use hydrogen as its on-board fuel for motive power. There are two methods for this; hydrogen internal combustion engines where hydrogen is “burned” in fundamentally the same method as traditional gasoline engines, and fuel cells that convert the chemical energy of hydrogen to electricity and water – the electricity then powers electric motors which drive the vehicle.

This is what a **Hydrogen Fueling Station** may look like. This also illustrates that the Lehigh Valley region still remains heavily involved in the technological development of the automobile, with local companies such as Air Products playing a critical role. So from the development of the first automobile through the future development of hydrogen fueled vehicles there is a local connection! And the future may not be very far away.

This fueling station is actually a replica of an operational hydrogen fueling station that Air Products designed and built for a Shell hydrogen station at Benning road in Washington, DC. This station represents the first integration of hydrogen fueling technology into an existing retail gasoline station in North America. The station uses Air Products' Series 200 fueling technology, an integrated vehicle fueling system, that provides the storage and dispensing of

hydrogen to the vehicles. The hydrogen fueling facility in Washington DC dispenses 350 and 700 bar hydrogen, as well as providing liquid hydrogen fueling capabilities. The hydrogen fueling station has the capacity to deliver 20 kilograms of compressed hydrogen per day.

*[Note to Docents: Many visitors are still worried about the explosive nature of hydrogen due memories of the Hindenburg. If asked, you can point out that more recent research points to the Hindenburg's canvas shell burning due to the fact that it was coated with a sealant that is chemically much like solid rocket fuel.]*

Note that, in our discussion of alternate fuels, we have now also observed four different types of fueling/charging stations. We had the 1924 gasoline pump, the very old (1909) electric charging station, the modern (1996) electric charging station, and the future hydrogen fueling station.

The final display in this gallery illustrates two wheeled transportation evolution in the form of bicycles and motorcycles.

- **2006 Paratrooper Bike** - Built for the military, this sturdy, full-size mountain bike is tough enough to drop from a plane, is built for the roughest riding terrain and folds in less than 30 seconds into a 3' x 3' pack. It can also be quickly unfolded from the pack to make a quick escape from the enemy!

- **2007 EZ Sprint Electric Bike** – Sit back and relax while the electric motor does the work, pedal along for light exercise, or turn it off and power up your muscles. This bike has a 30 mile range before recharging.

- **Inter 10 Bike** (late 1970's – early 1980's) – The 1970's saw a boom in bicycle sales as adults snapped up the new 10-speeds flooding the market. Lightweight bicycles from Europe, such as this one, were especially popular.

- **1943 Schwinn Bike** – Bicycles were popular substitutes for automobiles in the 1940's due to shortages of automobiles and gasoline rationing during and following World War II. Schwinn was a popular manufacturer of bicycles during this time period. This unrestored bike is an excellent example of the bikes of the time-period.

- **1903 Holley "Autobike" Motorcycle** – Before the Holley brothers made their name in carburetors, their shop in Bradford PA. created the Autobike. George Holley built his first motorcycle in 1901. An interesting fact was that the rider had to pedal up to speed in order to start the engine. Other modern touches such as: the engine placed low (lower center of gravity), in the middle of the frame (better balance), and a part of the frame itself (better rigidity) make the bike unique for its time.

- **1909 Pierce Four Motorcycle** – Born from the Pierce-Arrow brand, makers of ultra-luxury cars, the Pierce Four was road-going royalty in its day. In fact the company's high end approach was summed up by this quote from their 1912 catalog, "The Pierce Cycle Company does not propose to compete in price with products of other companies." However the Pierce company erred in its belief that it could turn a profit by offering motorcycles in which cost was no object. The marque shut down before the 1914 season. The Pierce delivered a smooth ride while cruising and it was packed with technical wizardry. This 1909 Four marks the first appearance of a four cylinder engine on a mass-produced motorcycle and its futuristic tubular frame doubled as gas

and oil tanks. There bikes are only a sampling of bicycle technologies. Additional bicycles and motorcycles are on display in various other areas of the museum including the 1<sup>st</sup> and 2<sup>nd</sup> floor corridors, the South Gallery, and the Educational Gallery (upstairs). Before leaving this gallery, I would like to remind you that there are various interactive displays and videos that you may wish to explore on your own after the formal tour.

#### Reference Statistics

##### 1891 Nadig

- Number Produced: 2
- Years of Production: 1891, 1896 (although his work on the first auto began in 1889)
- Engine: no. 1 – 1 cylinder, 2 hp; no. 2 – 2 cylinder, 14 hp
- Top Speed: 15 mph
- Length: 106", Width: 54", Height: 63"
- Price: never sold to public
- Built by: Henry Nadig (no company) in Allentown, PA
- Interesting Facts: Possibly first American automobile; built in Allentown; Driven up and down fourth street in Allentown; Henry's sons, Charles & Lawrence rebuilt the first auto in 1893 and replaced the engine with a 2 cylinder engine and added rubber tires to the wheels; car was displayed at New York's first auto show in 1900; damaged in 1921 – repaired

##### 1890 Studebaker Carriage

- Number Produced: hundreds of thousands – half of the wagons used at the peak of the westward migration were Studebakers.
- Years of Production: 1852 - 1966 (Studebaker continued as an auto manufacturer from 1902 till 1966)

##### • Engine – Horses

- Length: 112.5", Width: 67", Height: 89"
- Built by: Studebaker Brothers Manufacturing Company of South Bend IN
- Interesting facts: Studebaker family originally from Gettysburg, PA; Many chassis features borrowed from carriage construction were used in early autos

##### 1903 Ford Model A

- Number Produced: 670 or 1708 depending upon source referred to. Ford officially used the 670 figure.

##### • Years of Production: 1903

- Engine: 2 cylinder, 8 hp, displacement 100.4 cu
- Chassis: WB = 72"
- Technical: Planetary transmission, speeds – 2F/1R, chain drive.
- Top Speed: 30 mph
- Length: 8'6", Width: 5'2", Height: 5'2", Weight: 1250 lbs.
- Price: \$ 750
- Built by Ford Motor Company in Dearborn MI

- Interesting facts: One of the first autos produced by the newly formed Ford Motor Company; motor is located under the seat; 2 seater with detachable tonneau providing seating for two additional passengers who gained access to their seats through a rear door; First auto licensed in Allentown; Originally owned by Mr. Shoemaker of Shoemaker's Drug Store; First model in Fords "letter series" which went till Model T, then restarted with Model A.

#### 1910 Brockway Motor Wagon

- Number Produced: NA
- Years of Production: Brockway produced motorized trucks from 1910 till 1977
- Engine: 3 cylinder, 16 HP
- Technical: Chain Drive
- Price: NA
- Interesting Facts: One of the first motorized wagons produced by the company; Skinny wheels could penetrate mud and snow to contact underlying hard surfaces.

#### 1922 Detroit Electric

- Number Produced: NA
- Years of Production: 1907– 1937
- Engine: direct drive electric motor
- Top Speed: 20 mph, Range: 80 miles/charge
- Price: NA
- Built by: Detroit Electric Car Company (formally Anderson Electric Car Company) in Detroit, MI
- Interesting facts: One of the most elegant electric vehicles: curved glass sign of elegant design; popular with physicians and women; Famous owners included – Thomas Edison, John D. Rockefeller, and Clara Ford (wife of Henry Ford).

#### 1909 GE Charging Station

- Design: Arc rectifier using a mercury bulb converted AC current to DC current
- Technical: 110 volt Alternating Current (AC), 60 Hertz input; 15 – 45 volt Direct Current (DC), 20 amp output
- Built by: General Electric Co., Schenectady, NY

#### 1895 Electrobat IV

- Number Produced: NA
- Years of production: 1894 through 1897
- Engine: 2 – 75 pound electric motors powered by a 350 pound battery
- Top Speed: 20 MPH; Range: 25 miles
- Build by: Morris and Salom of Philadelphia
- Interesting Facts: Air filled tires; lower weight than earlier models; IV model was an improved version of earlier II model; used as Hansom cab (taxi cab);note unusual rack and pinion steering (A rack and pinion is a pair of gears which convert rotational motion into linear motion).

#### 1909 Stanley Steamer Model R

- Number Produced: 1200 total Steamers during 23 year production period.
- Years of Production: 1901 - 1924
- Engine: 2 cylinder, 20 hp.

- Chassis: WB = 112"
- Technical: non-condensing engine driving directly in the rear axle; boiler mounted up front (concealed by the coffin-like nose).
- Top Speed: 35 mph (In 1906 a Stanley Rocket set the world speed record of 127.7 mph)
- Weight: 1200 lbs.
- Price: \$ 850
- Built by Stanley Motor Carriage Co. in Dearborn MI
- Interesting facts: Between 1902 and 1917, Stanley's steam-powered cars outsold every gasoline powered automobiles; the end for the Stanley Steamer began in 1912 with Cadillac's introduction of the self-starter, the signal event which irrevocably tipped the scales in the gasoline engines favor. Car has a "Mother-in-Law" seat in rear.

#### 1976 CitiCar

- Number Produced: 2,300 (424 in 1976)
- Years of Production: 1974 - 1977
- Engine: GE series DC motor, 3.5 horsepower; Battery: 6 X 6 volt lead acid
- Dimensions: wheelbase 63", length 95.5"; width 55.0", height 60". weight 1250 lbs
- Technical: 2 door, 2 seat, 2 passenger, range 50 miles
- Top Speed: 38 mph
- Price: \$ 2730
- Built by: Sebring-Vanguard, Inc based in Florida.
- Interesting facts: most successful of the 1970's electric autos; one major flaw was the brakes which were quite small even for a lightweight car; the 2 door body was made of Cycolac plastic, over an aluminum-tubing roll-cage frame. Also, the lead acid batteries are directly below the thin foam seat that the passenger and driver are seated-upon.

#### 1996 GM EV1

- Number Produced: 1000
- Years of Production: 1996 – 1999
- Engine: 130 hp, 102 kw, 3 phase induction motor with 110 lb-ft torque; 26 sealed lead acid batteries (nickel, metal hydride batteries fitted on 1999 and up Gen II model); 50 – 99 mile range; 2-3 hour charge time on 220v home charger, 15 hour charge time on 110 v portable charger.
- Acceleration: 1 – 60 in under 9 seconds
- Technical: 2 passenger; Continuously Variable Transmission; Aluminum alloy body made with 100% recyclable body panels; 14" aluminum alloy wheels, self sealing tires.
- Price: Not available for sale – leased only - \$ 549 /mo. (\$ 399 in CA – State Government subsidized).
- Built by: General Motors (note – the first automobile to carry the GM nameplate instead of one of GM's marques)

- Interesting facts: Was available only in California and Arizona; Batteries weighted over 1000 lbs.; Subject of “Who Killed the Electric Car” movie
- 2010 Toyota Prius V Model Hybrid
- Number Produced: over 1.2 million by early 2009
- Years of Production: 1997 - present
- Engine: gasoline - 1.8 liter, 16 valve, 4 cylinder, 98 hp, 105 lb-ft torque; electric motor – permanent magnet AC synchronous, 80 hp (60kw), 650 Volt max, 153 lb-ft torque; battery – sealed Nickel—Metal Hydride (ni-MH), voltage 201.6 volts, 27kw; 50 mpg combined;
- Dimensions: wheelbase 106.3”, length: 175.6”, width 68.7”, height 58.7”, weight 3042 lbs.
- Technical: 3<sup>rd</sup> generation Prius; Electronically controlled, continuously variable transmission
- Price: Base - \$27,270, with options - \$ 33,183
- Built by: Toyota in Newark, NJ
- Interesting facts: solar roof – provides power for ventilation fan which provides cooling of cabin to near outside temperature; equipped with parking assist; bluetooth, and satellite radio.

#### 1999 NJ Venturer Hydrogen Fuel Car

- Number Produced: 1 (not a production vehicle)
- Engine: Electric motor - three phase AC Motor; Battery - 27 NiCad batteries (weight 1000 lbs); Power Source – PEM (Proton Exchange Membrane) Fuel Cell , 38.4 volts, 110 amps, nominal power output 4.3kw, stack weight 125 lbs.
- Dimensions: wheelbase 93”, length: 149.4”, width 62.6”, height 54.7”
- Top speed: 68 mph; Range: 400 miles
- Technical: single speed gearbox
- Price: Base - NA
- Built by: Base vehicle – 1996 Suzuki/GM Geo Metro; Electric drive version - Solectria Force (produced on the Geo Metro chassis with the base vehicle provided by GM to Solectria without an engine) built by Solectria Corporation of Wilmington, Massachusetts; Fuel cell addition – NJ Venturer Project
- Interesting facts: The New Jersey Venturer project combined government partners with corporate partners and academic partners to produce a “proof of concept” vehicle. It's objective was to produce the first fully functioning Hydrogen powered electric vehicle. The vehicle then participated in the 1999 Tour de Sol rally which was a seven day educational road rally event for electric vehicles. It featured 50 electric, hybrid electric, and solar assisted electric vehicles built by major auto manufacturers, students, and individuals. The vehicle placed second in the hybrid electric vehicle category and won the Engineering Excellence Award for the successful demonstration of a PEM fuel cell, and a special award for being the first fuel cell hybrid vehicle to complete a competition like the Tour de Sol.

#### 1903 Holly Motorcycle

- Number Produced: NA
- Years of Production: 1902 - 1911

- Built by: Holly Motor company of Bradford, PA
  - Interesting facts: The Holly company went on to become famous for the automotive carburetors.
- 1909 Pierce Four Motorcycle
- Number Produced: NA
  - Years of Production: 1909 - 1913
  - Engine: four cylinder, underslung; T-head (meaning the inlet and exhaust valves were on opposite sides of the bore); Bore and Stroke 2 3/16" X 2 1/4"; displacement 33.8 cu in (554 cc)
  - Technical: Outside flywheel and drive shaft; two speed transmission
  - Built by: Pierce Cycle Company of Buffalo, NY (Parry Pierce, the only son of George Pierce, owner of the Pierce Arrow car company, was given the Pierce Cycle Company).
  - Interesting facts: In their 1912 catalog, Pierce announced, "The Pierce Cycle Company does not propose to compete in price with products of other companies." However the Pierce company erred in its belief that it could turn a profit by offering motorcycles in which cost was no object. The marque shut down before the 1914 season. Interactive displays and videos:
    - Whose Auto was "First" Interactive – Questions are posed for visitor to decide who built the first automobile; flips give more information so the visitor can "decide" for themselves
    - What's a Car got that a Carriage Doesn't Interactive – Puzzle pieces of cars and carriages are arranged on a magnetic board. By placing the pieces in the correct locations, visitors discover the many basic parts and technologies that cars share with carriages.
    - A Couple of Questions Interactive – Questions about hydrogen fuel with answers under flips
    - Consumers Choice Interactive – Touch screen at which visitors select their preferences for buying a car. This entirely unscientific survey allows visitors to vote on their preferences – and to view the accumulated vote total.
    - Hydrogen Fueling Station Interactive – Visitors can fuel up a small car from a demo hydrogen fueling station. This fueling station was provided by Air Products. (an example of an Allentown area company still very much involved in the development of the automotive industry and future innovations.)
  - Stanley Video
  - Prius Video
  - Hydrogen Fuel Video
  - Motorcycle of the Future video

## 2nd Floor Corridor Gallery

*[Note to docents – The order of this narrative begins at the rear stairwell, circles around at the back of the second floor, and then progresses forward. Rearrange the order of items as necessary if your route proceeds differently.]*

Here we have a **1949 Salsbury Motor Scooter**. From 1902 to 1935 motor scooters in America were manufactured by small scooter firms and were rather lackluster in performance. That changed in 1936, however when Salsbury introduced the Motor Glide. The Motor Glide was a transformational design – very fast and smooth – a design that triggered the motor scooter craze that swept the country. The Salsbury Model 85, introduced in 1948, was the sleekest of the new scooters. The contemporary looking, rounded nose cone established it as one of the rarest U.S. built motor scooters. The aerodynamic design was the result of the nose cone being built by Northrop Aircraft. With the handlebars tapered back, convenient running board, and perfect balance, the driver enjoyed a comfortable ride in an upright seated position.

Next to the Salsbury scooter we have a **1947 Model 54 Cushman Scooter**.

Cushman Scooters universal popularity peaked around the end of World War II. The Model 54 is representative of the best sellers in the postwar period. In 1947 the Model 54 sold for \$ 325 as it is equipped – buddy seat, 600 X 6 tires, key lock ignition, Cushman script floor mat, silver painted rear bumper, horn and rear view mirror. At the end of the hall we have a **Hood from a Mack AC Truck**. As we noted downstairs, the Mack Trucks during this time period used the IM (for International Motors) nameplate in addition to the Mack nameplate. The model AC had its radiator mounted just ahead of the firewall and its nose in a pronounced “Renault” shape.

I would like to take this opportunity to give a little sales pitch for America on Wheels meeting, party, and special events facilities. In addition to the orientation room downstairs, we have the “**Long Haul Room**” that is available for rental. This large room is available for meetings, birthday parties, retirement parties, reunions, weddings, anniversaries, and other events. Your meeting and/or party can be combined with private museum tours and full catering services are available. Please contact our office staff for details.

This area is our **Children’s Area**, a place for children to let go and have some fun. We have a number of activities such as license plate rubbing available. We also have a separate area where children can **Design and Test Your Own Vehicles Using KNEX** construction toys and a test ramp. We only ask that parents assist us by supervising their children when using the area.



*[Note to Docents – Depending on activities you may continue the tour in the Educational Gallery or, if occupied, give a brief description of it. You can pick up the story after the Educational Gallery here.]*

Continuing down the corridor, we have a number of **water color paintings** by a local artist Carol Ross Noyes. These are available for sale. Contact the office if interested.

*[Just outside the rear entrance to the West Gallery]* Here we have three display cases containing gas powered model racers. There were known as **Spindizzies**. Starting in 1938, a new hobby skyrocketed with the production of gas powered model race cars. They were wood and metal cars powered by model airplane engines. They were run on a cable from a center post (one car at a time) or were also run on rail tracks where ball bearings held the cars onto the rails. These cars started out with speeds of 50 to 60 mph and today run at speeds over 200 mph.

*[Note to Docents – you may want to depart this section now and move into the West Gallery through the rear entrance. If so you can pick up this gallery discussion at this point when you come out of the West Gallery – front entrance.]*

*[Moving back through the hallway to just past the library]*

Down in the lobby, just as you came in the front door, we had a display board with a sampling of stories on “**My First Car**”. This display board (on the wall) tells a little more about the project.

This is our **Library**. We have many transportation related magazines and books available to aid anyone interested in researching the topic further.

In the back of the library, we have a display case containing **model cars**.

Outside the library, on the corridor wall, we have some posters on display. These posters are for sale in our gift shop. If you see a poster, you like, note the poster number and our gift shop staff can assist you.

*[Note to Docents – Head back toward the old office building.]*

Here we have another Cushman Scooter. This one is an **Allstate Deluxe 811.40 Scooter** which was sold by Sears and Roebuck, and remains among the most collectible – thanks to its attractive sheet metal design and the fact that fewer of this model were produced. It sold for \$263.50. It was introduced in 1951 and discontinued in 1957.

We also have a **U. S. Post Office Bicycle**. This bike was manufactured by Ross as a delivery bicycle and is equipped with a delivery basket and a bell. The builder’s delivery plate is mounted on the frame.

In the display case we have “**Francesco**”, a euro chess set. Truly a masterpiece, this set is superbly handcrafted and is the only chess set of its kind in existence.

Francesco J. Mariano commissioned artist Gary A Jacketti, who has studios in Berlin, Germany, and Avalon, NJ, to design and sculpt this unique and limited edition chess set that will fascinate chess players, automotive enthusiasts and collectors worldwide. The chessboard is made of inlaid exotic hard woods of holly and ebony. Chessmen are genuine hand assembled automobile components cast in solid bronze:

King – Cam Shaft Queen – Oil Shaft

Bishop – Valve Knight – Rocker/Spring

Castle – Castle nuts/Lifter Pawn – Sparkplug

*[Note to Docents – Before returning downstairs, you may want to point out the location of the 2<sup>nd</sup> floor restrooms.]*

## Education Gallery

Our education gallery can be used as a classroom or meeting room. When not in use for formal educational purposes, we use it as a display gallery. As an example of educational activities we support, this is a pictorial display board prepared by a local student, Ryan Ciocco, as a part of a school contest (Spring 09). Ryan chose to do a project titled “**Henry Ford's Affordable Wheels**”. As a part of his project he wrote a paper on Henry Ford and prepared this board in making a verbal presentation to a panel of judges. In addition to his local school, Ryan participated at a regional contest and at the state level. Ryan did some of his research here at America on Wheels.

In the corner, we have a **Selden Truck Radiator**. For a period of time, Selden trucks were produced here in Allentown – in fact at a factory about ¼ mile from this site! Mack was not the only truck produced here in Allentown. If you are familiar with the name of Selden in automotive history, it is the same Selden who was involved in a very famous patent battle in early automotive history. Selden was granted a patent for gasoline engine based automobiles, claiming to have built the first. Henry Ford and others went to court to challenge this claim and finally, after a very long legal battle, won. By the way, remember downstairs, the Nadig auto. This auto was brought up during the court battle to counter Selden's claim. After losing the court battle, Selden went into the truck business in New York, later moving to Allentown.

Next we have a number of automotive engines to illustrate the advances in engine technology.

- **Tecumseh engine** - single cylinder horizontal shaft cutaway engine. The cutaway portions allow you to see the internals of how a small, single cylinder work.

- **1926 Ford Model T engine and transmission** – mounted on a stand and equipped with a pulley to drive a belt. Engines often saw a second life after the vehicle was scrapped as an auxiliary power supply around the farm. Model T engines were produced from 1909 to 1927. The engine has four cylinders and is rated at 20 horsepower. The valves are mounted in the engine block, along side the cylinders. The engine had a displacement of 176.7 cu in, a bore and stroke of 3 4/4” X 4”, and a compression ratio of 3.98:1. The transmission was a two speed forward, one speed reverse, planetary gear system. It worked by pressing foot pedals which operated cloth lined bands which gripped steel drums (in an oil bath).

- **Ford Model A cutaway engine** – This engine has cutaway section to allow viewing of the internal operation. Model A engines were produced from 1927 – 1931. It is a four cylinder engine rated at 40 horsepower. The valves are mounted in the engine block, along side the cylinders. The engine had a displacement of 201 cu in (3.3L), a bore and stroke of 3.876” X 4.125”, and a compression ratio of 4.22:1.

□ **Chevrolet engine** - in line 6 cylinder, 230 cu in overhead valve engine. This engine is considered a third generation, Chevrolet straight 6 engine. (1 st generation was 1929-1936 "stovebolt", 2<sup>nd</sup> generation was 1937 -1963 in-line six). The third generation in-line six's were introduced in 1962 and continued till 1988. While similar to the earlier generations, this generation was lighter, had a different cast in bell housing pattern, had 7 main bearings (increased from 4), and a combustion chamber in a conventional wedge design much like the V8. The engine was used in trucks, Chevy full size cars, , Camaros, and Novas and the Chevy II. This generation of engine came in various displacements. This particular engine has a displacement of 230 cu in and produced 140 horsepower. It's bore and stroke are 3.875" X 3.250". The valves were overhead meaning they are mounted in the engine head (above the cylinder) instead of the block (alongside the cylinder).

□ **1926 Durant engine** - flathead in-line 6 cylinder. Durant (of General Motors fame) made automobiles under his own name after leaving General Motors. These automobiles used engines made by Continental. While earlier Durant's used a four cylinder engine, Durant's in the late 1920's were available with six cylinder engines. The term "flathead" refers to fact that the valves were located in the engine block, alongside the cylinders, thus allowing the head to be a much simpler design than overhead valve heads.

□ **Chevrolet Corvair engine** - 6 cylinder "pancake" engine with Powerglide transmission – note engine/transmission is sitting on a transmission jack fitted with special adapter specifically designed for the Corvair engine/transmission combination. Corvair engines were produced from 1960 to 1969 and were used in Corvair models. It is an air cooled engine (hence the extensive sheet metal work surrounding the engine. It was a horizontal, opposed six cylinder design meaning there was two halves to the engine block, each containing three cylinders. The crankshaft was located in the middle of the two engine block halves. The cylinders laid flat, in a horizontal position and the two sides "opposed" each other. There were two overhead valve heads, one for each side. The engine had four main bearings. The engine had several models, ranging in horsepower from 80 hp to 95 hp. The displacements ranged from 140 cu in to 164 cu in with a compression ratio of 8.0:1 to 8.25:1. The engines were normally equipped with two (one for each side) single barrel carburetors but a high performance option of four single barrel carburetors was available. To aid the air cooling process, the engine blocks and heads were made from aluminum with steel cylinder wall sleeves and steel valve seats.

□ **Chevrolet V8 engine** - 350 cu in overhead valve with Turbo Hydramatic 350 3 speed automatic transmission. One of the most famous (and successful) engines Chevrolet produced was the "Small Block V8". This series of engines were produced from the mid 1950's through the present. The series consisted of various displacement sizes. This particular engine was a 350 cu in (5.7L) displacement and became the GM corporate standard. Over the years, every American General Motors division except Saturn used it and its descendants in their vehicles. Over 90,000,000 small block engines have been built. The 350 cu

in engines ranges in horsepower rating from 145 hp to 370 hp and had a bore and stroke of 4.000" X 3.48"

- **Volkswagen Beetle engine** – This engine was used in the famous Volkswagen Beetle from 1936 to 2006. It is an air cooled engine and is one of the most widely used and versatile internal combustion engines in the world. The engine was produced with various horsepower ratings, and various displacements.

- (on table in center of room) – **Briggs and Stratton engine** - 1 cylinder, Overhead valve engine

- (on table in center of room) – **Power Products Corp. cutaway engine** - 1 cylinder engine

Next we have several wheeled vehicles for the children.

- **Child's 2 seat "Surrey" wagon**

- **Baby Stroller**

- **Baby Carriage**

- **AC Delco Child's "race car"** - battery powered car

- **Child's tricycle** (in the form of a horse)

Moving on to a collection of very unique bicycles:

- **Workman Work Tricycle** – Workman is based in NYC and is the oldest maker of bikes still in existence. They are known for their human powered bikes for an industrial or special needs setting.

- **High Wheeler** (circa 1880's)

- **Sociable Bicycle for Two** – This unique bicycle for two is known as the Buddy Bike and was made in Taiwan. The concept of having two people ride a bike in this configuration dates back to the early 1900's. This allows the passengers to see each other and talk. Each rider has a view. This is a great date bike to see if you can work together!

- **ZEM Bike for Four (2 X 2)** – The ZEM (Zero Emissions Machine) was the idea of an individual from Switzerland and was meant to take his family for a Sunday ride. This particular ZEM has done Bike New York (42 miles) and numerous parades. It has unique features of independent pedaling, gears for each rider, and stadium seating.

- **Four Passenger Linear Bike** (by Santana) – This particular four passenger bike was owned by Billy Romp. Billy took his family of five on a 4500 mile trip from Vermont to Alaska on this bike. The fifth, very young person was carried by an attached trailer. Going down some hills this bike, according to Billy reached speeds close to 50 mph.

- **Monster Cruiser** (by Coker) – Coker Tire is famous for its automotive tires for vintage cars. Coker Tire made four unique human powered vehicles including a 36" Unicycle. The Monster Cruiser has 36" tires too. Thank big and ride a Monster Cruiser!

- **Gasoline Powered Monocycle** (One wheel) by Kerry McLean – Kerry McLean is known for having the world's record of the fastest monocycle – 57 mph. Kerry McLean is an artist who designs, makes and rides his own works of art.

□ **Human Powered Monocycle** (One Wheel) by Kerry McLean – in addition to the motorized versions, Kerry also design, makes and rides human powered versions of the monocycle.

□ **Conference Bike; Built for Seven** – The Conference Bike was the idea of artist Eric Staller.

This human powered vehicle has been used for many parades as well as the visually impaired. The visually impaired can use this work of art for exercise and socialization. This series of Conference Bike was made in Germany. Eric Staller has a history of living in the Kutztown, PA area during the early development of this unique work of art.

□ **1993 Specialized Epic Touring Bicycle** – The high tech frame materials that make racing bikes lightweight and fast eventually trickle down to recreational cycling. The Specialized Epic featured a frame made of carbon-fiber tubing connected with aluminum lugs. The owner of the bike then added a mirror and a front bag with a map pouch to improve his safety and comfort.

□ **Unicycle**

In this display case we have illustrate the development of **fueling subsystems** (Carburetors) for automobiles.

## West Gallery

Welcome to our gallery of muscle cars which features some very famous cars with lots of power under the hood.

*[Note to Docents: In case you are asked; a muscle car is usually a 2 door, midsize car from the mid sixties to the early seventies, with that “go fast” look, and a powerful engine under the hood. They are usually, but not always, thought of as American. (Australia has their own versions as well) When they were new, they were usually cheaply to marginally priced. According to the June 1967 issue of Road Test magazine, a “muscle car” is “Exactly what the name implies. It is a product of the American car industry adhering to the hot rodder’s philosophy of taking a small car and putting a big engine in it. An interesting fact: Even though the Mustang is thought of as the original Pony or Muscle car, the truth is that the Barracuda was released one week before the Mustang.*

As we enter the gallery, you will see to your left, a **1969 AMC-SC Rambler**. This is an example of AMC’s version of a true muscle car. They took the biggest motor they had, a 390 cubic inch, and stuffed it under the hood of this car. This is one of the most wild paint jobs that were given to any muscle car back in the day. There were only 1,512 of these built, and this may have been the only production model.

Next, we have a 1967 **Shelby Mustang Gt-500**. There were only 2,050 of these built, and this is the only one that came with a dual 4 barrel induction system from the factory. The thing that makes these cars special is the motor. It is a huge 428 cubic inch engine.

*[Note to Docents: In case you are asked about the “FE” as it says on the sign, FE was a certain group of motors built by Ford from 1958 to 1976. FE stands for Ford-Edsel. Edsel being another company owned by Ford that only lasted three years, but that is another story. Several well known examples of this engine family are the 352, the 360, and the 390.*

A modified version of this car was used in the 2000 movie, *Gone In Sixty Seconds*, with Nicolas Cage.

On your right, we have a **1970 Chevelle SS**. You may have seen these at local car cruises, as they are a very popular car among the collectors world. This particular car has a massive 454 cubic inch engine in it. The cowl induction hood is used to suck in cold air from the outside of the car, effectively giving the engine more power.

And to the left of the Chevelle is a **1964 Ford Galaxie 500**. This car is very rare because of the 427 cubic inch motor under the hood. Even though the lines on this car are quite different from those from the 'muscle' era, it is thought of as an early muscle car. The engine was used in NASCAR, and this is what brought Ford the win at Le Mans.

*[Le Mans is a race held near the town Le Mans, France that goes for a 24 hour period. It is the oldest automotive endurance race in history, having been held every year since 1923. The race is held on blocked off public roads, testing the drivers' abilities to the max, along with holding together for the full 24 hours.]*

Next, we have a **1965 Corvette**. In 1965, Corvette was offered with 4-wheel disk brakes. This was a huge improvement over the older, less effective drum brakes. The car could practically stop on a dime! Also introduced this year, was the 396 cubic inch big block engine. This was the first time that 400hp was offered in a Corvette. Interestingly enough, this year there was a parts shortage, and the big block hood was placed on many small block cars. This car in front of you, has the small block 327, and does indeed have the correct hood.

Here, we have a **1969 Plymouth Roadrunner convertible**. This is a very rare car, as there were only some 2,100 of these built. *[Note the mistake on the sign towards the bottom- 1,111 built]*

The standard motor for these cars was a 383 cubic inch, while half way through the year a 440ci with 3 two barrel carburetors (known as a 440 six pack) was added as an option. The Roadrunner was named Motor Trend Car of the Year in 1969. This color is very unusual for a muscle car, as it is not very flashy.

This is a **1969 Corvette convertible**. This particular example has a 427 big block under the hood with 435 hp. It is one of only 390 produced with the aluminum heads. *[Not many people went with aluminum back then because of the problem with coolant freezing and cracking the engine block or heads. Now, many engines are made of aluminum.]* These cars were sometimes known as "Mako Sharks" because of their sleek, flat look. Some of the Corvettes were also badged with "Stingray" because of their look as well. However, the Stingray was a slightly more expensive version which is fairly rare.

The Camaro. This brings lots of visions to mind, as over the years it has gained popularity as being one of the more desirable muscle cars. This is a **1968 Camaro SS** with a 396 cubic inch big block. This baby puts out 350 horsepower, and it will move! 1968 was only the second year for the Camaro, and not many changes were made from 1967 to 1968. There were only 2,579 built with the big block this year.

Here is a **1969 AMC AMX**. AMC had problems with their image in 1969, and if they were going to stay afloat, they had to change that. The AMX was outfitted with a 315hp 390 cubic inch engine, and with a weight of only 2,826lbs, this car is quick. Several speed records were set with the AMX, one of which was set at

the Bonneville Salt Flats at 189mph. What makes this car fairly unusual is the color package. It has the "Big Bad Orange" package, of which there were only 284 built.

The Pontiac GTO is a highly respected, highly sought after muscle car. This **1965 GTO** was a very original car at 50,000 miles when it was restored. These cars were known for being very quick and stripped down for the most part. They were definitely the definition of a muscle car. The 389 cubic inch engine with the 3 carburetors puts out 360 horse power and 424 earth shaking ft lbs of torque!

Next, we have a very rare **1970 Plymouth Roadrunner**. This special car is one of fifteen Hemi powered 1970 Roadrunners! It puts out 425 horsepower, and has a rear end gear ratio of 3.55, making this thing a burnout machine! What makes this car even more special is the color. It is the **ONLY** black 1970 Plymouth Roadrunner ever built. Take a good look, because you probably won't see another 1970 Hemi Roadrunner again, and you most definitely won't see another black one!

*[Docents: If anyone asks why the Hemi is so special, it is because it was the most efficient motor out of all of them. The combustion chamber is dome shaped, so more of the fuel is burned. Gasoline engines are only about 20-30% efficient, so every little bit helps!]*

This is a **1969 Chevy Nova SS**. These cars were first released to the public halfway through 1969. What made these cars really interesting was the fact that they are very unassuming looking. *[Docent: Maybe compare this car with the Roadrunner next to it. Notice the body lines that are a fair amount different]* The flat body panels just make it look like an ordinary car. However, once you put a big block 396 under the hood, it's no ordinary car any more. The 375hp and 415ft lbs of torque move this baby up to 60mph in 5.8 seconds! This is not your grandma's grocery getter!

Last, but definitely not least, we have a **1965 Dodge Coronet Superstock** car. There were only 102 of these built, and who knows how many are left. This car has a factory lightweight Hemi under the hood. This means that the engine block is made of aluminum, rather than steel. Also, making this car even lighter, the doors, hood, and fenders are all made out of fiberglass. To top it all off, the engine is putting out 425hp, which means when you put the pedal down, you're gonna know it!