Influential Cars of the 20\textsuperscript{th} Century

III

Jim Rauf
Influential Cars of the 20th Century

- **1932 Ford** introduces the V8 engine
  - Eight cylinders for low price car
- **Packard** luxury **Twin Six**
  - Twelve cylinders for high price car
- **National Highway User Conference (Alford Sloan)** lobbies government promoting highway construction
- **1933 Veed Root** computer meter for gasoline pumps—sell by dollars rather than gallons
- **Tobata Casting and Nihonirst** form **Motor Vehicle Manufacturing Co (Nissan)** to manufacture **Datsun** cars
  - First drive in movie in New Jersey
- **Kiichiro Toyoda Co** begins motor vehicle division
- “**Neal Deal**” sponsors road construction
Influential Cars of the 20th Century

• **1934 Chrysler** debuts streamlined styling with its **Chrysler** and **Desoto** eight cylinder **Airflow** models—they do not sell well

• Most cars have independent front suspensions

• **Cadillac** offers a high output generator and voltage regulator

• **Chrysler** offers automatic overdrive transmission

• Radio controls are built into dash boards

  Packard’s installation

• Independently sprung front wheels are on all **GM** cars and on the **Plymouth** and **De Soto**

• They are also optional equipment on **Hudson** and **Terraplane**
Influential Cars of the 20th Century-Automatic Transmissions

• The first automatic was invented in 1904 by the Sturtevant brothers of Boston
• It had two forward gear ratios and engine-driven flyweights which controlled the gear selection
• At higher engine speeds, high gear was engaged
• As engine RPM decreased, the gearbox would shift back to low
• The transmission was prone to sudden failure, due to being unable to withstand forces from the abrupt gear changes.
Influential Cars of the 20\textsuperscript{th} Century-Automatic Transmissions

- **1934 REO** introduces REO Self-Shifter automatic transmission
- It was actually two transmissions connected in series
- For ordinary driving, one unit upshifted itself automatically in relation to car speed through the engagement of a centrifugal multiple-disc clutch
  - Similar to idea used by the Sturtevants
- The second transmission was shifted manually and was used only when a lower gear was needed
Influential Cars of the 20th Century—Drive Trains Automatic Transmissions

• **1940 Oldsmobile** introduced the **Hydra-Matic** transmission
  
  Its built-in control system combined balanced hydraulic pressures dependent on car speed, engine speed and the demands of the driver expressed through the accelerator pedal

• The initial **Hydra-Matic** control system was complex, its weight was excessive and its power losses were considerable

• These problems were overcome and **Hydra-Matic** became a national institution in the American cars

•
Influential Cars of the 20th Century—Automatic Transmissions

• The **Hydra-Matic** automatic transmission consisted of three planetary gearsets that were operated hydraulically

• A fluid coupling was used to connect the engine and transmission

• Credit for perfecting the fluid coupling goes to **Chrysler**, which developed the concept in 1937

• **Chrysler** did not make use of it until 1941, when the **Chrysler Fluid Drive** transmission was introduced

• This was not an automatic unit, but a standard transmission with a fluid coupling, not a clutch

• By 1948, the automatic transmission had evolved into the **hydraulic torque converter** that we know today coupled to a planetary geartrain

• **Buick** was the first to use the torque converter

• **1948 Buick** offered the **Dynaflow** fully automatic transmission as a $244 option on the **Roadmaster**

• Within three years, 85 percent of **Buicks** had the **Dynaflow**

• Other manufactures soon followed with similar units -- **Chevrolet Powerglide, Fordomatic and Merc-O-Matic** in 1950; and the **Chrysler M-6 Torque Converter Automatic** in 1951

• The automatic transmission further reduced the difficulty (and skill required?) in driving an automobile
Influential Cars of the 20th Century-Automatic Transmissions
Influential Cars of the 20th Century - Unibody Construction

• **1934 Citroen Traction Avant**
  - First production *unibody* vehicle
  - First successful production *front wheel drive* vehicle
  - The unibody method of construction required less material than building a separate frame and chassis
  - It allowed for lighter vehicles to be developed, which consequently delivered benefits in fuel economy, handling and ride comfort-increased torsional stiffness
  - Changes in the structure of the car can require substantial modification to the underlying engineering of the vehicle
  - Most current automobiles use unit construction

Produced 1934 to 1957
Influential Cars of the 20th Century - Front Wheel Drive

- The **1929 Cord L29** was the first American front wheel drive car
  - It was not produced after 1932
- Early large FWD cars, without power steering, were hard to steer at low speeds
- It was not until later in the 20th century that FWD became popular in mass market cars
- Initially for smaller, lighter cars, and then for larger heavier cars
- More compact drive train packaging allows better passenger space
- Most “high line” cars have more gone to all wheel drive rather than FWD
1935 Influential Cars of the 20th Century

- **GM’s Chevrolet** introduces the first all steel station wagon built on a panel truck chassis
- Michigan auto workers form the **United Auto Workers (UAW)** union
- In the U.S. there is one car for each person five persons
- **Toyoda** introduces its first car the **A1**
- Federal government spend 10 times more on roads than on mass transit

- The **1935 Carryall** was used for work and for passengers, and it was a revolutionary vehicle when it debuted
Influential Cars of the 20th Century

• **1935** auto workers in Michigan form the United Auto Workers (UAW) union

• Federal government **Works Projects Administration (WPA)** spend 10 times more money on road construction than on mass transit

• Oklahoma City is first American city to introduce parking meters

• The U.S. has one car for each five people

• **Toyota’s** first car the **A1**
Influential Cars of the 20th Century

• **1936 GM** introduces “knee action” independent front suspension on all **Chevrolet** models

• **Ford** and **GM** share ~90% of the Japanese car market

• **GM**, **Standard Oil** and **Firestone** form **National City Lines** to “motorize” mass transit
  • Goal is to replace electric street cars with busses

• **Chrysler’s** 25% market share passes **Ford’s** 22% with **GM** having 43%

• **Ford’s Lincoln** releases the **Zephyr** with “aerodynamic” styling
Influential Cars of the 20th Century

- **1936 Toyoda Model AA** debuts

- A total of 1,404 AA sedans was produced from 1936 until 1943, when the model was replaced by the more austere AC

- It was a fully enclosed 4 door sedan that largely copied the design of the **Chrysler Airflow** sedan

- It had a metal body on a metal ladder chassis

- The metal body was of modern construction

- The rear doors open backwards

- The front glass spanned the entire width of the body

<table>
<thead>
<tr>
<th>Toyota</th>
<th>AA</th>
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<tbody>
<tr>
<td>Production</td>
<td>1936–1943</td>
</tr>
<tr>
<td>Assembly</td>
<td>Japan</td>
</tr>
<tr>
<td>Predecessor</td>
<td>A1</td>
</tr>
<tr>
<td>Successor</td>
<td>AC</td>
</tr>
<tr>
<td>Class</td>
<td>medium size family car</td>
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<tr>
<td>Body style(s)</td>
<td>sedan (AA), cabriolet (AB)</td>
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<tr>
<td>Layout</td>
<td>front-engine, rear-wheel drive</td>
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<tr>
<td>Platform</td>
<td>ladder chassis</td>
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<tr>
<td>Engine(s)</td>
<td>Type A</td>
</tr>
<tr>
<td>Transmission(s)</td>
<td>3 speed floor shift manual</td>
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<tr>
<td>Wheelbase</td>
<td>2,851 mm (112.2 in)</td>
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<tr>
<td>Length</td>
<td>4,737 mm (186.5 in)</td>
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<tr>
<td>Width</td>
<td>1,734 mm (68.3 in)</td>
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<tr>
<td>Height</td>
<td>1,737 mm (68.4 in)</td>
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<tr>
<td>Curb weight</td>
<td>1,500 kg (3,306.9 lb)</td>
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</tbody>
</table>
Influential Cars of the 20th Century

• **1936 UAW** strikes GM
• **GM** signs the first auto manufactures’ contract with the **UAW**
• Many cars move the hand brake from the center to the left side of the driver’s seat
  • More room in front for passengers
• 54% of U.S. families have a car
• Defrosters debut on several models
• Manufacturers emphasize comfort and “beauty”
  • Accommodation
  • Ride
  • Styling

• **1937 Toyoda** changes the company name to **Toyota**
• **GM** and **Chrysler** recognize the **UAW**
  • But not **Ford**
• The **Automobile Safety Foundation** lobbies the government for highways
• **Buick** executes a model change over in 10 days
• Column mounted gear shifts begin to replace floor shifts
• **Chrysler** introduces front seats that can be adjusted up and down as well as forward and back
• **Studebaker** introduces windshield washers
Influential Cars of the 20th Century

- **1938 Nash** introduces its “conditioned air system”
- **GM** adds a radio option on **Buicks**
- **GM** introduces the first “concept car”, the “Y Job”
  - Styled by **Harley Earl**
  - The car features:
    - Hidden headlights
    - Power operated windows
    - A power operated convertible top
    - Power operated door locks
    - Power steering
- **Chevrolet** introduces a vacuum operated shift
- **Chrysler** introduces the fluid coupling transmission
Influential Cars of the 20th Century

• **1939 Nash** adds a thermostat to its “Weather Eye” air conditioning system – the first heating and cooling system in a mass market car

• **Ford** introduces the medium price **Mercury**
  • All **Mercuries** are V8 powered

• California approves plans for a “freeway” system in the Los Angeles area

• The Pasadena freeway opens in 1940
Influential Cars of the 20th Century-Crosley

- **Powell Crosley** releases his **Crosley** car
- It is the first “compact car” built in the U.S.
- The firm was active from 1939 to 1952, interrupted by World War II production
- The station wagons were the most popular model, but also offered were sedans, pickups, convertibles, a sports car, and even a tiny jeep-like vehicle
- For export, the cars were badged **Crosmobile**.
Influential Cars of the 20th Century-Crosley

- **Crosley** introduced several "firsts"
- The first affordable, mass-market car with an overhead camshaft engine in 1946
- The first use of the term 'Sport(s-) Utility' in 1947, for a 1948 model year convertible wagon
- The first American car to be fitted with 4-wheel caliper type disk brakes
- America's first post-war sports car, the 1949 **Hotshot**
Influential Cars of the 20th Century - Crosley
Influential Cars of the 20th Century - America’s First Unibody Car

• **1941 Nash 600** is a first model year example of the US auto industry’s first mass-produced unibody car
Influential Cars of the 20th Century

• **1941** after a strike at *Ford’s River Rouge Plant* Ford recognizes the **UAW**
  • Last of the “Big Three” to do so

• **Chrysler** introduces the **Town & Country** 4-door 8-passenger station wagon it is the first the first **“Woodie”** with an all-steel roof

• It used the roof of the current **Chrysler Imperial** 4-door 8-passenger limousine

• Th car had “Barrel Back” doors that opened out from the center beneath the fixed rear window
Influential Cars of the 20th Century

• **1941 Packard** offers power windows

• **Cadillac** offers **Hydra Matic** automatic transmission

• **Chrysler** offers **Fluid Drive** on **Dodge, DeSoto** and **Chrysler** cars

• **Buick** debuts the dual compound carburetor
  • Actuated by depressing accelerator pedal
  • Permits increased power:
    • Smaller engine 107 hp to 125 hp
    • Larger engine 141 hp to 165 hp

• Early entry into the “horsepower Race”?
Influential Cars of the 20th Century - Jeep

- **1941 Willys** began production of the **Jeep** for the Army
- **Willys**, **Ford** and **American Bantam** had submitted proposals to the Army for a vehicle that was to become the **Jeep**
- The **Willys** design was selected
- Both **Willys** and **Ford** manufactured Jeeps from 1941 to 1945

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Weight</td>
<td>2,453 lb curb</td>
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<tr>
<td>Length</td>
<td>132+1/4 in</td>
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<tr>
<td>Width</td>
<td>62 in</td>
</tr>
<tr>
<td>Height</td>
<td>overall, top up: 69+3/4 in</td>
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<tr>
<td>Passengers</td>
<td>3 to 4</td>
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<tr>
<td>Engine</td>
<td>134 cu in Inline 4 Willys L134 &quot;Go Devil&quot;</td>
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<tr>
<td>Power</td>
<td>60 hp</td>
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<tr>
<td>Payload capacity</td>
<td>1,200 lb</td>
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<tr>
<td>No. built</td>
<td>WW II total: 647,925 Willys MB: 359,489 Ford GPW: 277,896</td>
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<tr>
<td>Transmission</td>
<td>3 speed x 2 range transfer case</td>
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<tr>
<td>Suspension</td>
<td>Live axles on leaf springs front and rear</td>
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<tr>
<td>Ground clearance</td>
<td>8+3/4 in</td>
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<tr>
<td>Fuel capacity</td>
<td>15 US gal</td>
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<tr>
<td>Range</td>
<td>300 mi</td>
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<tr>
<td>Maximum speed</td>
<td>65 mph</td>
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</tbody>
</table>

• 1941 Willys began production of the Jeep for the Army

• Willys, Ford and American Bantam had submitted proposals to the Army for a vehicle that was to become the Jeep

• The Willys design was selected

• Both Willys and Ford manufactured Jeeps from 1941 to 1945
Influential Cars of the 20th Century--Jeep

- The Jeep was an all-purpose vehicle during World War II-used in all theaters of the war and in the subsequent conflict in Korea
- It was the basis for civilian Jeeps and various derivative Willys vehicles up to the present day
- Including arguably the first SUV
Influential Cars of the 20\textsuperscript{th} Century- U.S. Auto Industry Military Production

- **Chrysler**
  - Aircraft engines
  - Ammunition
  - Aircraft sections
  - M3/M4/M26 Tanks
  - Marine engines
  - Tank engines
  - Trucks

- **Ford**
  - B-24 bombers
  - Tank engines
  - GE Turbosuperchargers
  - Tanks
  - P&W R-2800 engines
  - Trucks
  - Jeeps

- **Willys**
  - Jeeps

- **General Motors**
  - P&W engines
  - Airplanes
  - Cannons
  - Machine guns
  - Rifles
  - Munitions

- **Hudson**
  - Aircraft components
  - Engine components

- **Nash**
  - P&W engines

- **Packard**
  - RR Merlin engines

- **Studebaker**
  - Trucks
  - P&W and Wright engines
Influential Cars of the 20th Century

• Automobile design and styling progressed from 1932 to 1942
• World War II interrupted all progress for the auto industries around the world
• Car styling changed from being boxy to streamlined
• Engines became more powerful
• Brakes improved automatic transmissions entered the market
• Manufacturers emphasized styling and driver and passenger comfort
• Weaker manufacturers, especially the luxury car manufacturers were felled by the Great Depression
• American auto industry moved to solidify dominance of the “big three”
• All the manufacturers stepped up to provide military equipment to support the war effort
• They would “come back” after the war to satisfy a huge civilian demand