

# Most Ambitious Transportation Projects of the 21st Century

Johannes Simon, Getty Images

Anyone who has had their commute disrupted by bulldozers and pavers knows how long it takes to patch one small stretch of highway. But what about when the project is more elaborate — say, blasting through the Alps or tunneling under the largest city in the country? As our world gets smaller and everyone wants to make connections faster, countries all over are undergoing major projects that would change the way we get from Point A to Point B. Some are already in the works while others are pipe dreams (Can you imagine getting from New York to London in an hour?). And as Bostonians learned during the Big Dig, these undertakings don't happen quickly. Read on for the world's most ambitious transportation projects.



History Channel

## 10. Canada's Ice Road

This 353-mile road in Canada's Northwest Territories is the world's longest heavy-haul ice road, with more than 300 miles constructed over frozen lakes — and it has to be rebuilt every year. Starting in January, workers fight wind-chills that drop to 50 below, using water trucks, bulldozers, and plows as they build an eight-lane highway that, as the ice below thickens, can support eight-axle big rigs. To test the safety of the road, workers use high-tech radar to profile the ice sheet and, if needed, water trucks add water to increase the thickness of the ice, which can exceed 42 inches. Once completed, loaded trucks are limited to speeds of up to 15 mph over ice and 18 mph over the 64 land portages. And the procession of vehicles is nearly continuous, owing to the small two-month window during which conditions allow safe transit. By mid-April, the road is closed, with Mother Nature converting the icy stretches back to impassable, frigid waters.

Discovery Communications, LLC

## 9. Transatlantic Tunnel

New Yorkers longing for a carryout out lunch of bangers and mash from a London

pub, fret not: a Transatlantic Tunnel could make such a craving a reality. The hypothetical tunnel would whisk travelers between Manhattan and London in trains that reach speeds of 5,000 mph, making the 3,100-mile-long connection in less than an hour. Technically, the project would be daunting, with the floating tunnel tethered to massive anchors sunk into the sea floor. More than 50,000 tunnel sections would be required, each transported into place by a gargantuan immersion pontoon. For those looking for a truly international experience, connections between London and Paris could also be offered, enabling New Yorkers to grab a Nutella crêpe along the Champs-Élysées and return to their office in less time than it takes to lunch at a neighborhood Applebee's.

Daniel Barry, Bloomberg / Getty Images

## 8. New York's Second Avenue Subway

Plans for a subway line along Manhattan's Second Avenue were proposed as early as 1929, and progress has finally been made. The four-phase, \$17 billion Second Avenue Subway project connecting the 8.5-mile stretch under Second Avenue from Harlem to Lower Manhattan officially broke ground in April 2007. Tunneling beneath millions of Manhattanites is no easy feat, and a tunnel-boring machine

will excavate most of the route, a challenging proposition, especially noting the ubiquitous high-rises blanketing the area. And engineers must be alert to the ever-changing geology along the route, which includes sands, clays, faults, shear zones, and fractured rock. The scheduled completion of Phase One, from 105th Street to 63rd Street, has been delayed twice (from 2014 to 2016), while Phases Two, Three, and Four lack funding and — like the prospect of finding an apartment for less than \$2,000 a month — may be merely wishful thinking.

Discovery Communications, LLC

## 7. Bering Strait Crossing

A direct Asia-North America link, spanning the 50 miles of frigid seawater between Russia's Chukotka Peninsula and Alaska's Seward Peninsula, would be more than politically symbolic. At least one plan envisions shuttling petroleum worth billions between the two continents. While the shallow depth of the Strait's waters poses few construction challenges, building would be limited to less than six months a year since winter temps dip to 50 below. And a bridge would require anchoring more than 200 enormous piers, with self-propelled cranes transporting pre-constructed segments. Despite excessive care, all could still be for naught as six-foot-thick

ice chunks floating freely in the water could cause significant trauma to any final structure. All of this, of course, assumes the allocation of boatloads of dollars and rubles required for such a massive undertaking. Some estimates peg the cost at more than \$100 billion, not including the tab for building a transit infrastructure on either side — at least 500 miles of roads or railways would be required on the U.S. side alone.

Wikipedia

## 6. Shanghai's High-Speed Rail

Shanghai has the world's largest rail system — and it's getting bigger. The city already has 261 miles of lines (as opposed to London's 253 miles and New York's 228 miles). Major work is underway on more than 85 additional miles, which are scheduled for completion by 2012. An additional 180 miles of lines is planned for use by 2020. If all goes according to schedule, the city will offer more transit coverage than all of Japan. A transit-starved population will embrace each new mile with standing-room-only enthusiasm: Daily ridership in 2009 averaged more than 3.5 million people and a record 6.5 million people scrounged for seats on a single day in July 2010. Shanghai isn't alone in China as a rapid transit up-and-comer. The country has committed \$150 billion to metro mass transit for projects through 2015, the largest urban transportation investment in history.

SSPL / Getty Images

## 5. Strait of Gibraltar Crossing

Arthur Clarke proposed a Strait of Gibraltar crossing in his 1979 science fiction novel *The Fountains of Paradise*, but connecting Europe to Africa is not just the working of science fiction. In 2003 the Spanish and Moroccan governments undertook a study to investigate the feasibility of connecting the two countries by either bridge or tunnel. Several engineers have come forth with proposals, from a bridge comprised of three-mile spans to a submerged bridge that traverses a three-mile-wide floating island. But this would be no

Chunnel, as the Gibraltar Strait waters are significantly deeper and less stable than the English Channel. The Azores-Gibraltar Transform Fault cuts through the Strait, which previously has generated violent earthquakes. The nine-mile journey would need to be reworked to a winding 25-mile tunnel, with a proposed construction timeline that would take more than 15 years to complete. But this longer tunnel would still pose significant engineering challenges, as it would pass through water roughly 980-feet deep, almost 50 feet deeper than the world's deepest undersea tunnel.

Alamy

## 4. Irish Sea Tunnel

As early as 1897, money has been spent investigating the feasibility of a tunnel linking Ireland and Great Britain. More than a century later, both the Irish and British governments have formally addressed the idea on numerous occasions, though it remains theoretical. At least five possible routes have been identified, each varying in complexity and geological concerns. Infrastructure shortcomings elevate projects cost estimates. Any tunnel linking the two islands would require the use of electric traction, which means lines on both ends must run via electricity — which the majority of Ireland's trains do not.

Kathy Versluys, Adventure Cycling Association

## 3. United States Bicycle Route System

Adventure Cycling have been working tirelessly along with the American Association of State Highway and Transportation Officials to accommodate the growing number of bike enthusiasts longing for a seamless inter- and intra-state system for motor-free transit. The United States Bicycle Route System will be a 50,000-mile network of at least 29 routes. Perhaps the most incredible aspect of the project is its relatively low cost compared to most public transportation projects. The routes mostly leverage existing infrastructure, though when gaps exist (i.e. bridges that don't accommodate cyclists), states seek funding through traditional sources. The entire project has been proposed as a state-match funded program, though like many bills on

Capitol Hill these days, its final status remains unresolved. Routes connecting Virginia to North Carolina and to Illinois through Kentucky are completed and a Michigan route is scheduled to be ready in 2011.

Johannes Simon, Getty Images

## 2. Gotthard Base Tunnel

Switzerland's Gotthard Base Tunnel, which is set to open in 2017, will be the culmination of nearly a quarter of a century of digging. At just over 94 miles long, the world's largest railway tunnel will shave an hour off the existing Zurich-Milan train route by plunging through miles of majestic Alps. Currently, north-south trains traveling through the Gotthard Pass (a vital passageway in Europe) are limited in size, owing to a mind-numbing procession of spiral tunnels that span a great height differential. But the new tunnel will eliminate those bottlenecks, allowing standard freight trains to pass easily and often, at speeds exceeding 150 mph. The construction is taking place in five different sites via four access tunnels, a timesaving gesture that's oh-so-Swiss. Site access is tricky if not treacherous, with one station requiring an access tunnel more than half-a-mile from the valley floor, at the end of which two shafts drop precipitously more than half-a-mile to the base tunnel level.

Lycas50, Wikipedia

## 1. Marmaray Tube Tunnel

Eight-mile-long tunnels are perhaps passé for the Swiss, but they only have to contend with impenetrable mountains, not major earthquakes. The latter will be the risk for Turkey's Marmaray Tube Tunnel, the world's deepest immersed tube tunnel. The tunnel, which will connect Asia to Europe, is routed near the North Anatolian Fault, which according to experts has greater than a 60-percent chance of generating a sizable seismic event within the next 30 years. As a result, while much of the tunnel will bore through rock, a mile-long section under the Istanbul Strait will be encased in an immersed tube along the seabed. This underwater habitrail will integrate flexible, steel plate joints designed to withstand major quakes. When complete in 2013, the tunnel will provide a vital rail link

for Turks, whose rail usage is predicted to climb from roughly 3 percent to 27 percent, the world's third highest.

## **Up Next: The World's 10 Wildest Rides**

### ***More Articles You Might Like***

- The World's Most Unique Modes of Transportation [AOL Travel]
- Top 10 Underwater Travel Experiences [AOL Travel]
- 15 Best Artificial Beaches in the World (Photos, Poll) [Huffington Post]
- 9 Ways to Take An Indulgent "Eat, Pray, Love" Vacation (Like Julia Roberts) [Huffington Post]
- SNEAK PEEK: The World's Highest Hotel Opens This December [Forbes]
- Global Etiquette: Quirkiest Cultural-isms Around the World [Forbes]
- The Life of a Sumo Wrestler (Amazing Photos) [National Geographic]



You are here: Main » Travel Ideas and Interests » Most Ambitious Transportation Projects of the 21st Century - AOL Travel News

AOL ORIGINAL

## Most Ambitious Transportation Projects of the 21st Century

by [Jerry Soverinsky](#) [Subscribe to Jerry Soverinsky's posts](#)  
Posted Aug 16th 2010 11:00 AM

0 Comments

Print



Johannes Simon, Getty Images

transportation projects.

Anyone who has had their commute disrupted by bulldozers and pavers knows how long it takes to patch one small stretch of highway. But what about when the project is more elaborate -- say, blasting through the Alps or tunneling under the largest city in the country? As our world gets smaller and everyone wants to make connections faster, countries all over are undergoing major projects that would change the way we get from Point A to Point B. Some are already in the works while others are pipe dreams (Can you imagine getting from New York to London in an hour?). And as Bostonians learned during the [Big Dig](#), these undertakings don't happen quickly. Read on for the world's most ambitious

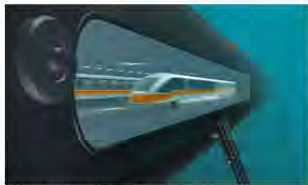


History Channel

loaded trucks are limited to speeds of up to 15 mph over ice and 18 mph over the 64 land portages. And the procession of vehicles is nearly continuous, owing to the small two-month window during which conditions allow safe transit. By mid-April, the road is closed, with Mother Nature converting the icy stretches back to impassable, frigid waters.

### 10. Canada's Ice Road

This 353-mile road in Canada's Northwest Territories is the world's longest heavy-haul ice road, with more than 300 miles constructed over frozen lakes -- and it has to be rebuilt every year. Starting in January, workers fight wind-chills that drop to 50 below, using water trucks, bulldozers, and plows as they build an eight-lane highway that, as the ice below thickens, can support eight-axle big rigs. To test the safety of the road, workers use high-tech radar to profile the ice sheet and, if needed, water trucks add water to increase the thickness of the ice, which can exceed 42 inches. Once completed,



Discovery Communications, LLC

for a truly international experience, connections between London and Paris could also be offered, enabling New Yorkers to grab a Nutella crêpe along the Champs-Élysées and return to their office in less time than it takes to lunch at a neighborhood Applebee's.

### 9. Transatlantic Tunnel

New Yorkers longing for a carryout lunch of bangers and mash from a London pub, fret not: a Transatlantic Tunnel could make such a craving a reality. The hypothetical tunnel would whisk travelers between Manhattan and London in trains that reach speeds of 5,000 mph, making the 3,100-mile-long connection in less than an hour. Technically, the project would be daunting, with the floating tunnel tethered to massive anchors sunk into the sea floor. More than 50,000 tunnel sections would be required, each transported into place by a gargantuan immersion pontoon. For those looking



Daniel Barry, Bloomberg / Getty Images

includes sands, clays, faults, shear zones, and fractured rock. The scheduled completion of Phase One, from 105th Street to 63rd Street, has been delayed twice (from 2014 to 2016), while Phases Two, Three, and Four lack funding and -- like the prospect of finding an apartment for less than \$2,000 a month -- may be merely wishful thinking.

### 8. New York's Second Avenue Subway

Plans for a subway line along Manhattan's Second Avenue were proposed as early as 1929, and progress has finally been made. The four-phase, \$17 billion Second Avenue Subway project connecting the 8.5-mile stretch under Second Avenue from Harlem to Lower Manhattan officially broke ground in April 2007. Tunneling beneath millions of Manhattanites is no easy feat, and a tunnel-boring machine will excavate most of the route, a challenging proposition, especially noting the ubiquitous high-rises blanketing the area. And engineers must be alert to the ever-changing geology along the route, which



Discovery Communications, LLC

excessive care, all could still be for naught as six-foot-thick ice chunks floating freely in the water could cause significant trauma to any final structure. All of this, of course, assumes the allocation of boatloads of dollars and rubles required for such a massive undertaking. Some estimates peg the cost at more than \$100 billion, not including the tab for building a transit infrastructure on either side -- at least 500 miles of roads or railways would be required on the U.S. side alone.

### 7. Bering Strait Crossing

A direct Asia-North America link, spanning the 50 miles of frigid seawater between Russia's Chukotka Peninsula and Alaska's Seward Peninsula, would be more than politically symbolic. At least one plan envisions shuttling petroleum worth billions between the two continents. While the shallow depth of the Strait's waters poses few construction challenges, building would be limited to less than six months a year since winter temps dip to 50 below. And a bridge would require anchoring more than 200 enormous piers, with self-propelled cranes transporting pre-constructed segments. Despite



Wikipedia

million people scrounged for seats on a single day in July 2010. Shanghai isn't alone in China as a rapid transit up-and-comer. The country has committed \$150 billion to metro mass transit for projects through 2015, the largest urban transportation investment in history.

### 6. Shanghai's High-Speed Rail

Shanghai has the world's largest rail system -- and it's getting bigger. The city already has 261 miles of lines (as opposed to London's 253 miles and New York's 228 miles). Major work is underway on more than 85 additional miles, which are scheduled for completion by 2012. An additional 180 miles of lines is planned for use by 2020. If all goes according to schedule, the city will offer more transit coverage than all of Japan. A transit-starved population will embrace each new mile with standing-room-only enthusiasm: Daily ridership in 2009 averaged more than 3.5 million people and a record 6.5





SSPL / Getty Images

stable than the English Channel. The Azores-Gibraltar Transform Fault cuts through the Strait, which previously has generated violent earthquakes. The nine-mile journey would need to be reworked to a winding 25-mile tunnel, with a proposed construction timeline that would take more than 15 years to complete. But this longer tunnel would still pose significant engineering challenges, as it would pass through water roughly 980-feet deep, almost 50 feet deeper than the world's deepest undersea tunnel.

## 5. Strait of Gibraltar Crossing

Arthur Clarke proposed a Strait of Gibraltar crossing in his 1979 science fiction novel *The Fountains of Paradise*, but connecting Europe to Africa is not just the working of science fiction. In 2003 the Spanish and Moroccan governments undertook a study to investigate the feasibility of connecting the two countries by either bridge or tunnel. Several engineers have come forth with proposals, from a bridge comprised of three-mile spans to a submerged bridge that traverses a three mile-wide floating island. But this would be no Chunnel, as the Gibraltar Strait waters are significantly deeper and less



Alamy

Ireland's trains do not.

## 4. Irish Sea Tunnel

As early as 1897, money has been spent investigating the feasibility of a tunnel linking Ireland and Great Britain. More than a century later, both the Irish and British governments have formally addressed the idea on numerous occasions, though it remains theoretical. At least five possible routes have been identified, each varying in complexity and geological concerns. Infrastructure shortcomings elevate projects cost estimates. Any tunnel linking the two islands would require the use of electric traction, which means lines on both ends must run via electricity -- which the majority of



Kathy Versluys, Adventure Cycling Association

cyclists), states seek funding through traditional sources. The entire project has been proposed as a state-match funded program, though like many bills on Capitol Hill these days, its final status remains unresolved. Routes connecting Virginia to North Carolina and to Illinois through Kentucky are completed and a Michigan route is scheduled to be ready in 2011.

## 3. United States Bicycle Route System

Adventure Cycling have been working tirelessly along with the American Association of State Highway and Transportation Officials to accommodate the growing number of bike enthusiasts longing for a seamless inter- and intra-state system for motor-free transit. The United States Bicycle Route System will be a 50,000-mile network of at least 29 routes. Perhaps the most incredible aspect of the project is its relatively low cost compared to most public transportation projects. The routes mostly leverage existing infrastructure, though when gaps exist (i.e. bridges that don't accommodate



Johannes Simon, Getty Images

easily and often, at speeds exceeding 150 mph. The construction is taking place in five different sites via four access tunnels, a timesaving gesture that's oh-so-Swiss. Site access is tricky if not treacherous, with one station requiring an access tunnel more than half-a-mile from the valley floor, at the end of which two shafts drop precipitously more than half-a-mile to the base tunnel level.

## 2. Gotthard Base Tunnel

Switzerland's Gotthard Base Tunnel, which is set to open in 2017, will be the culmination of nearly a quarter of a century of digging. At just over 94 miles long, the world's largest railway tunnel will shave an hour off the existing Zurich-Milan train route by plunging through miles of majestic Alps. Currently, north-south trains traveling through the Gotthard Pass (a vital passageway in Europe) are limited in size, owing to a mind-numbing procession of spiral tunnels that span a great height differential. But the new tunnel will eliminate those bottlenecks, allowing standard freight trains to pass



Lycas50, Wikipedia

immersed tube along the seabed. This underwater habitat will integrate flexible, steel plate joints designed to withstand major quakes. When complete in 2013, the tunnel will provide a vital rail link for Turks, whose rail usage is predicted to climb from roughly 3 percent to 27 percent, the world's third highest.

## 1. Marmaray Tube Tunnel

Eight-mile-long tunnels are perhaps passé for the Swiss, but they only have to contend with impenetrable mountains, not major earthquakes. The latter will be the risk for Turkey's Marmaray Tube Tunnel, the world's deepest immersed tube tunnel. The tunnel, which will connect Asia to Europe, is routed near the North Anatolian Fault, which according to experts has greater than a 60-percent chance of generating a sizable seismic event within the next 30 years. As a result, while much of the tunnel will bore through rock, a mile-long section under the Istanbul Strait will be encased in an