CONGRESSIONAL BUDGET OFFICE
COST ESTIMATE

September 27, 2018

S. 3277
Space Frontier Act of 2018

As ordered reported by the Senate Committee on Commerce, Science, and Transportation on August 1, 2018

SUMMARY

S. 3277 would direct the Department of Transportation (DOT) and the National Oceanic and Atmospheric Administration (NOAA) to streamline the permitting processes for commercial space transportation and commercial activities for observing the earth. The bill also would require the National Aeronautics and Space Administration (NASA) to continue operations of the International Space Station (ISS) through 2030. CBO estimates that implementing S. 3277 would cost $34 million over the 2019-2023 period, assuming appropriation of the necessary amounts.

Enacting S. 3277 would affect direct spending by extending NASA's authority to enter into enhanced-use lease agreements; therefore, pay-as-you-go procedures apply. CBO expects NASA would use that extension to enter into agreements with third parties to construct and renovate energy production, launch, and other specialized facilities. CBO estimates that enacting the bill would increase direct spending by $30 million over the 2019-2028 period. The bill would not affect revenues.

CBO estimates that enacting S. 3277 would not increase net direct spending by more than $2.5 billion or on-budget deficits by more than $5 billion in any of the four consecutive 10-year periods beginning in 2029.

S. 3277 would impose intergovernmental and private-sector mandates, as defined in the Unfunded Mandates Reform Act (UMRA). CBO estimates that the total cost of complying with the mandates would fall well below the annual thresholds established in UMRA for intergovernmental and private-sector mandates ($80 million and $160 million in 2018, respectively, adjusted annually for inflation).

ESTIMATED COST TO THE FEDERAL GOVERNMENT

The estimated budgetary effect of S. 3277 is shown in the following table. The costs of the legislation fall within budget functions 250 (general science, space, and technology), 300 (natural resources and environment), and 400 (transportation).

	By Fiscal Year, in Millions of Dollars						
	2018	2019	2020	2021	2022	2023	2019-2023
INCREASES IN SPENDING SUBJECT TO APPROPRIATION							
Regulation of Commercial Space Transportation							
Estimated Authorization Level	0	6	6	6	6	7	31
Estimated Outlays	0	4	6	6	6	7	29
Regulation of Earth Observation Activities							
Estimated Authorization Level	0	1	1	1	1	1	5
Estimated Outlays	0	1	1	1	1	1	5
Total							
Estimated Authorization Level	0	7	7	7	7	8	36
Estimated Outlays	0	5	7	7	7	8	34
INCREASES IN DIRECT SPENDING							
Estimated Budget Authority	0	1	2	3	4	4	14
Estimated Outlays[a]	0	*	1	2	3	3	9

* = less than $500,000

a. CBO estimates that enacting S. 3277 would increase direct spending by $30 million over the 2019-2028 period.

BASIS OF ESTIMATE

For this estimate, CBO assumes that S. 3277 will be enacted in 2019 and that the necessary amounts will be appropriated each year. Estimated outlays are based on historical spending patterns for the affected activities.

Spending Subject to Appropriation

In total, CBO estimates that implementing the bill would cost $34 million over the 2019-2023 period.

Regulation of Commercial Space Transportation. DOT regulates activities related to commercial space transportation by issuing permits and licenses to entities that launch or reenter commercial space vehicles or that operate related facilities and by overseeing the safety of those activities.

Title I would require DOT to streamline and expedite those regulatory activities. In particular, the bill would reduce, from 180 days to 90 days, the timeframe for reviewing applications for permits or licenses submitted by existing permittees or licensees. The bill also would direct DOT to issue, by February 1, 2019, a draft rule to revise existing regulations and to establish, in consultation with the Department of Defense and NASA, a streamlined regulatory regime for commercial space transportation. Title I also would specify a variety of administrative and reporting requirements.

Using information from the DOT, CBO estimates that implementing title I would cost $29 million over the 2019-2023 period, primarily for additional staff and computer systems that would be needed to meet the bill's requirement to complete reviews of certain applications for permits and licenses in half the amount of time currently allowed. That estimate reflects an annual increase of about 25 percent over the amount of funding provided in 2018 for those purposes ($22 million, which supports about 100 full time staff).

Regulation of Earth Observation Activities. Title II would change how NOAA oversees the licensing of private entities that collect data from space to be processed into imagery of the earth. The bill would add technical requirements to the licensing process, shorten the timeline for NOAA's license review, and require NOAA to notify the Congress within one business day if it fails to respond to a license applicant within 120 days. NOAA also would be required to promulgate new regulations to implement those changes.

Using information from NOAA and because of the expedited timeline and technical nature of the licensing review process under the bill, CBO expects NOAA would need four new employees with specialized technical capabilities to implement title II as well as additional resources to promulgate the required regulations. Those employees would help meet the expedited timeline under the bill for processing license applications and the requirement for more technical reviews of those applications. Therefore, CBO estimates that implementing title II would cost $1 million a year, or $5 million over the 2019-2023 period. In 2018, NOAA allocated about $1 million to such licensing activities.

Other Costs. Title III would direct NASA to conduct various activities to promote public-private partnership opportunities with small businesses. Using information on existing activities under the agency's Office of Small Business Programs, and based on the costs of similar tasks, CBO estimates implementing that provision would cost less than $500,000 over the 2019-2023 period.

Current law requires NASA to operate the International Space Station through 2024. The bill would extend that authorization through 2030. Based on the costs to operate the ISS in recent years, CBO estimates that continuing those operations would cost about $4 billion annually beyond 2024, assuming the appropriation of the necessary amounts.

Direct Spending

Current law authorizes NASA to lease its underused property to nonfederal entities and to retain and spend any payments from those lease agreements for property maintenance and capital improvements without further appropriation. The authority for NASA to enter into such enhanced-use lease (EUL) agreements expires on December 31, 2018. S. 3277 would extend that authority through December 31, 2020. The bill also would permit NASA to accept in-kind consideration under EUL agreements in the form of industrial infrastructure and business facilities for civil space and national security purposes. (Under current law, NASA's authority to accept in-kind consideration is limited to facilities for producing renewable energy.)

In the past, NASA has used its EUL authority to lease out buildings and land for nonfederal purposes—for example, providing office space to entities with educational or research missions. In some cases, NASA has allowed limited reuse or redevelopment of those properties; those arrangements result in no significant net costs to the agency.[1] CBO expects that some of the EUL agreements NASA would enter into over the 2019-2020 period would be similar in nature to those previous transactions. Based on NASA's leasing activity in recent years, CBO estimates that the agency would enter into eight additional EUL agreements over the 2019-2020 period with average annual payments to the federal government totaling $225,000 per lease. CBO expects that those lease payments, which would be recorded in the budget as reductions in direct spending, would be offset by an expenditure soon thereafter, so that there would be no net effect on the deficit.

In addition, CBO expects that some of those agreements would contain terms for third parties to construct and renovate energy production, launch, and other specialized

1. More information on NASA's current lease agreements is included in National Aeronautics and Space Administration, Report on NASA's Enhanced Use Leasing for Fiscal Year 2017 (May 2018).

facilities.[2] While NASA could use other authorities to enter into similar agreements with third parties, CBO expects the EUL extension and expansion of in-kind consideration under S. 3277 would accelerate and increase the likelihood of such transactions. CBO also expects that some of those projects would be governmental in nature because they would be located on federal land and subject to NASA control, and because NASA or other federal agencies such as the Department of Defense would be major users of the services supported by those facilities. Thus, in CBO's view, the costs of developing and constructing facilities in that manner are governmental transactions that should be recorded in the budget.[3]

Based on proposed leasing plans and costs for similar facilities, CBO estimates that under EUL agreements that would be finalized over the 2019-2020 period, third parties would invest a total of about $200 million in energy production, launch, and other specialized facilities. The budgetary effects of governmental transactions financed by third parties would depend on the extent and nature of federal support. In CBO's view, transactions supported entirely with equity from private entities should have no net effect on the federal budget because the cost of those activities would be fully offset by income from nonfederal sources.

However, CBO expects that some of those third parties would recover at least a portion of their investments in specialized facilities that are used by NASA or other federal agencies through contracts with the federal government—for example, to launch satellites or other federal payloads into space. In addition, based on the experience of NASA and other agencies that have the authority to accept certain forms of in-kind consideration under EUL agreements, CBO expects that expanding allowable in-kind consideration could result in the renovation or construction of facilities for exclusive use by the federal government. CBO considers such financing on behalf of the federal government for government activities to be similar to an agency using federal borrowing authority to improve its physical infrastructure and treats the costs of such transactions as direct spending. As such, the full cost of such long-term commitments that obligate the government to make payments in future years should be recorded in the budget upfront.[4]

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2. NASA recently announced plans to use its EUL authority to enter into an agreement with SpaceX to construct launch support facilities. For more information, see National Aeronautics and Space Administration, "NEPA Documents," *Draft Environmental Assessment for Space Exploration Technologies Operations Area on Kennedy Space Center* (April 11, 2018), https://go.usa.gov/xPxpx.

3. For more information on the criteria for identifying governmental activities, see Congressional Budget Office, *How CBO Determines Whether to Classify an Activity as Governmental When Estimating Its Budgetary Effects* (June 2017), www.cbo.gov/publication/52803.

4. For more information on the budgetary treatment of third-party financing, see Congressional Budget Office, *Third-Party Financing of Federal Projects* (June 2005), www.cbo.gov/publication/16554.

In 2016, NASA reported a backlog of about $1.6 billion worth of maintenance and improvement projects across five locations where it currently leases out space.[5] CBO expects that NASA would use its EUL authority to facilitate such transactions over the 2019-2020 period. Based on the federal government's potential share of benefits from any new projects (which CBO estimates would average 30 percent over the lifetime of those projects), we estimate that NASA would use the EUL authority under S. 3277 to finance the construction of facilities valued at about $35 million—equivalent to roughly 2.5 percent of its maintenance backlog at those locations. Based on historical spending patterns for similar activities, CBO estimates that direct spending would increase by $30 million over the 2019-2028 period for those projects.

Uncertainty

CBO aims to produce estimates that generally reflect the middle of a range of the most likely budgetary outcomes that would result if the legislation was enacted.

For legislation that would direct agencies to carry out certain activities, CBO's estimate of spending subject to appropriation is based on costs and historical spending patterns for similar activities. CBO cannot foresee with certainty the amount of additional resources DOT, NOAA, and NASA would require to modify and expand existing activities under the bill. CBO also cannot predict potential shifts in NASA's projects, priorities, and timelines or major infrastructure needs for the ISS that may affect the amount and pace of future spending for ISS operations.

In addition, if enacted, direct spending under S. 3277 could be higher or lower than CBO's estimate because of the following three sources of uncertainty.

- First, CBO cannot precisely predict the extent to which the agency would use the EUL extension under S. 3277 instead of its other alternative financing and leasing authorities to facilitate the construction of specialized facilities. In such cases, CBO has adopted a convention of assuming a 50 percent chance of an agency using its discretion under the bill.

- Second, CBO cannot foresee with certainty the value of third parties' investments in such facilities. Generally, investments of higher value would increase the potential for direct spending.

- Finally, CBO cannot predict with certainty whether or how the federal government would use facilities constructed by third parties under EUL agreements. If the

5. National Aeronautics and Space Administration, *Deferred Maintenance Assessment Report: FY16 NASA-Wide Standardized Deferred Maintenance Parametric Estimate* (September 30, 2016), https://go.usa.gov/xPxd2 (PDF, 1.8 MB).

federal government is the primary user of the services provided by those facilities, and thus, serves as the main source from which third parties recover their investments, the government's share of indirect financing for and benefits from those projects would be higher, resulting in greater direct spending. However, if the federal government makes little or no use of the services provided by such facilities, the resulting net effect on direct spending could be insignificant or negligible. CBO expects that expanding NASA's authority to accept in-kind consideration could increase the potential for projects where the government is a primary or exclusive user.

Because of those uncertainties, the budgetary effects of enacting S. 3277 could differ significantly from those provided in CBO's cost estimate.

PAY-AS-YOU-GO CONSIDERATIONS

The Statutory Pay-As-You-Go Act of 2010 establishes budget-reporting and enforcement procedures for legislation affecting direct spending or revenues. The net changes in outlays that are subject to those pay-as-you-go procedures are shown in the following table.

CBO Estimate of Pay-As-You-Go Effects for S. 3277, as ordered reported by the Senate Committee on Commerce, Science, and Transportation on August 1, 2018

	By Fiscal Year, in Millions of Dollars												
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2018-2023	2018-2028
NET INCREASE IN THE DEFICIT													
Statutory Pay-As-You-Go Impact	0	0	1	2	3	3	4	4	4	4	5	9	30

INCREASE IN LONG-TERM DIRECT SPENDING AND DEFICITS

CBO estimates that enacting S. 3277 would not increase net direct spending by more than $2.5 billion or on-budget deficits by more than $5 billion in any of the four consecutive 10-year periods beginning in 2029.

MANDATES

S. 3277 would impose intergovernmental and private-sector mandates, as defined in UMRA. The bill would require entities that launch and operate earth observation satellites to submit technical information about their satellites, including plans to mitigate orbital debris, to NOAA when applying for licenses. The requirements would affect both private space companies, such as Space X, as well as public entities, such as universities that conduct research. Using information from NOAA and companies in the space industry about the costs of complying with current regulations, CBO estimates that the incremental cost of complying with the mandates in the bill in total would fall well below the annual thresholds established in UMRA for intergovernmental and private-sector mandates ($80 million and $160 million in 2018, respectively, adjusted annually for inflation).

PREVIOUS CBO ESTIMATE

On September 7, 2018, CBO transmitted a cost estimate for H.R. 5503, the National Aeronautics and Space Administration Authorization Act of 2018, as ordered reported by the House Committee on Science, Space, and Technology on April 13, 2018. CBO estimates that implementing H.R. 5503 would increase direct spending by $25 million over the 2019-2028 period and spending subject to appropriation by $21.1 billion over the 2019-2023 period. H.R. 5503 would authorize the appropriation of funds in 2019 for NASA activities. Both bills would extend NASA's authority to enter into EUL agreements; however, S. 3277 also would expand NASA's authority to accept in-kind consideration under such agreements. CBO estimates that provision would increase the potential for direct spending; accordingly, the estimates of direct spending under the two pieces of legislation differ.

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